Volume XXXVII Number 15 PUBLISHED WEEKLY AT THE MALLERS BUILDING CHICAGO, APRIL 8, 1920

Twenty Cents a Copy Three Dollars a Year

Hudson Is World Leader In Fine Car Sales

See How Dealers Have Prospered— You Can Have That Sort of Success, Too

The Hudson Super-Six has been the world's largest selling fine car, almost from the hour of its introduction.

That, of course, has meant enviable business success for Hudson dealers. How they are satisfied is proved by the fact that 97% of the present Hudson product is handled through men whose connection is seven years or more. And that shows the permanency of Hudson franchises, too. Its dealers are enjoying the fruits of every year they have builded into their business.

That is far from true with all automobile dealers. How often the enterprise and work of years is lost through the withdrawal of a franchise, requiring a fresh start and the development of a new line.

The surest way of building prosperity and a certain future is through connection with a company whose product itself carries the atmosphere of excellence, of good standing and superior quality.

Backed by the organization that has made Hudson the world's largest selling fine car, with a product whose record is unequalled for achievement, you will prosper just as all our other dealers have prospered—if you are the Hudson type of dealer.

A Hudson franchise means more than immediate profits, which it surely brings also. It means association with the leaders of the industry. It means the greater capital of prestige, which goes with the name and reputation of Hudson.

But perhaps the greatest thing that a Hudson franchise stands for is permanency in a successful business.

There may be an opening in your territory. Write or wire today.

Hudson Motor Car Company



Detroit, Michigan

(H-4)



WHEN you have found a tool—absolutely automatic in action—that fits every nut on every automobile rim, you have found the most serviceable single tool for use in connection with motor cars.

Every Garage and repairman, every car owner, should have one.

The New Improved UTILITY Universal Rim Wrench

is all steel with indestructible handles and jaws, even in the face of rough usage. Small enough to carry in any tool box. Big enough to do its job—always. Finished in black enamel and nickel. Packed in fibre board cartons of ten.

Dealers: Use UTILITY UNIVERSAL RIM WRENCHES yourself—and sell them to your customers. The demand grows bigger all the time. Easy sellers. Order from your jobber.

Jobbers: Get in touch with us.

HILL PUMP VALVE COMPANY

Mfrs. of UTILITY Protected Heaters, UTILITY Pedals for Fords, UTILITY Pumps, UTILITY Universal Rim Wrenches and UTILITY Universal Wrenches

Archer Avenue and Canal Street

CHICAGO

THE ZINKE CO.

SALES DEPARTMENT
1323 S. Michigan Avenue, Chicago

OTOR A

Published Every Thursday by

THE CLASS JOURNAL COMPANY

MALLERS BUILDING
59 East Madison Street, CHICAGO
HORACE M. SWETLAND, Pres.
E. M. COREY, Treas.

W. I. RALPH, Vice-Pres.
A. B. SWETLAND, Gen. Mgr.

Member Audit Bureau of Circulations; Member Assoc. Business Papers, Inc.

Vol. XXXVII

Chicago, April 8, 1920

No. 15

CONTENTS

Copyright, 1920, by the Class Journal Co.

Selecting a Service Station Site	7
Take a Personal Interest in Customers	10
Service Methods As a Salesman	12
Publicity Through "Free Rides"	13
What Race Pits Can Teach You	14
Giving a Little "Personal Interest"	14
A Valuable Tractor Construction Book	15
Working to a Master Sheet	16
Putting the Farm on a Factory Basis	18
Selling Service	19
Service On a Budget System	20
A Novel Ford Design	35

NEWS SECTION

NEWS SECTION	
Chicago Boulevard Link Bridge Nears Completion	23
Cincinnati to Adopt New Traffic Rules	24
General Motors in Insurance Business	24
Freight Car Situation Improving	25
Indianapolis Freight Embargo Improves	
California Investigates Gasoline Prices	
Federal Compilation of Tractor Data	27
St. Louis Dealers to Enforce Gasoline Tax	28
Texas Dealers Hold Convention	29
Hoosier Race Worth \$80,000	30
Coast Wants Motor Caravan	30
French Adopt National Road Plan	31
General Price Increase Seen	
Chicago Plans for Used Car Exhibit	32
Macon Prepares for Show	32
Oklahoma City Show Draws Well	33
Detroit Retains Combination Show	
Seattle Show Draws 25,000	
DEPARTMENTS	

DEI ARTIMERTIS	
Standard Tractor Service Operations	
Servicing the Overland Four	40
Garage Planning	42
The Readers Clearing House	44
The Accessory Corner	.54
Service Equipment	
Passenger Car Serial Numbers	56
Automotive Repair Shop	57
Motor Truck Specification Tables	58
Weekly Wiring Diagram	63
From the Four Winds	

MOTOR AGE

MALLERS BUILDING CHICAGO

Phone Randolph 6960 Cable Address "Motage"

CHICAGO

E. E. HAIGHT, Manager

DAVID BEECROFT, Directing Editor B. M. IKERT, Editor

BRANCH OFFICES

DETROIT, 95 Fort St., W., Phone Main 1351

CLEVELAND, 536-540 Guardian Bldg., Main 1142

NEW YORK CITY, U. P. C. Bldg., 239 W. 39th St.

Phone Bryant 8760

PHILADELPHIA, Widener Bldg., Phone Walnut 5601

		SUBS	CRIPT	TON RA	TES			
United St	tates, Mex	ico and	U. S.	Possessio	ns	\$3.00		
	r Countrie	s in Po	stal U	nion	***************************************	6.00	per	

Entered as second-class matter, September 19, 1899, at the Post Office, Chicago, Illinois, under Act of March 3, 1879.

Owned by UNITED PUBLISHERS CORPORATION, 239 W. 39th St., New York, H. M. Swetland, Pres.; Charles S. Phillips, Vice-Pres.; W. H. Taylor, Treas.; A. C. Pearson, Sec.





SURE-SEA

Self-Curing Patch

You know, and every other dealer knows, that a driver should have a good tube patch in the car all the time. You can make many sales by suggesting this to your customers and recommending our Sure-Seal All Rubber Self-Curing Patch.

Sure-Seal repairs permanently and in a few minutes all punctures and blowouts in tubes. It is made of finest resilient rubber and when applied stretches with the inner tube. It has great strength. It is self-curing-requires no heat or acid. Simple, quick and easy to use. Repairs anything made of rubber.

Order from your jobber

Send For A 1920 Catalog

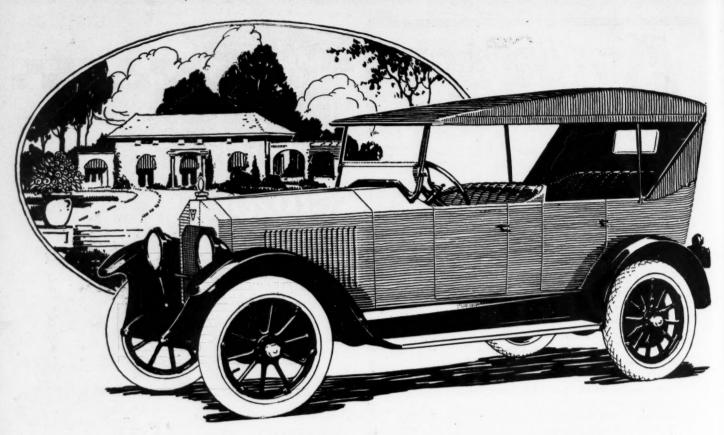
The entire line of Dutch Brand tire and chemical necessities is fully described and illustrated. Your copy will be mailed on re-

Van Cleef Brothers

Manufacturers

Woodlawn Ave., 77th to 78th St. Chicago, U. S. A.





Style That Holds First Place



THE instant recognition of the Velie's leadership in the authoritative style is one of the big chapters on the motor cars of 1920.

Velie holds and increases this prestige every day. The style grows on critics of the beautiful in car design.

You have the satisfaction that comes with possession of the last word in style when you drive a Velie. And you have the thrill of great power—the comfort of deep-plaited genuine leather upholstery—plenty of room—the most advanced convenience. Six body styles, open and closed.

Within a few days Velie will announce a new Six—smaller in size—lower in price—of foremost quality—a fit companion to these larger Velie models. The dealer is indeed fortunate who holds a Velie selling franchise. He has a Velie satisfying every demand, and in addition enjoys the support of an organization whose reputation and resources are second to none in the industry. We invite correspondence.

Velie Motors Corporation, 113 Velie Place, Moline, Ill.

Builders of Automobiles, Trucks and Tractors



Publisher's Service Station

Rendering Service to Help You Render Service



Locations Personal Interest Prosperity Free Rides

Flat or house hunting is a popular sport these days and if you have been one of the hunters you'll agree it is mighty poor sport.

Hunting and selecting a good business site is a much easier task if one understands something about "site selection."

In times gone by we used to first pick out a vacant lot and then say "There's where we'll build our store." Not so now, at least not with the wide-awake merchant. The old way of picking out any old site and hoping that an "Open for Business" banner would bring home the bacon has been passed up for the more modern methods of large institutions.

When the big organizations that run a chain of 5 and 10 cent stores or grocery or cigar stores want a new or additional location, they are usually certain the site they select will produce business. They employ men whose business it is to survey and study localities and people. These men actually count the number of people that pass a certain point in a given time and also make every other conceivable observation. When their investigation is completed the company they represent has some concrete data from which a site can be chosen.

This may sound like a big task for securing a site for a salesroom or garage, and perhaps it is, but there is a lot to be said about locations for service stations, salesrooms or garages. That's why you should be interested in the

lead story in this number of MOTOR AGE, entitled "Selecting a Site."

PERSONAL Contact.

Now and then we hear of dealers who cannot get enough business to keep their shop busy. Many of them have depended too much on car and accessory sales to carry them along and sort of lost sight of the possibilities of the rear end of their business. There's a dealer in Des Moines, Iowa who, through personal contact with his customers, gets lots of business for his shop and he attributes his success to his motto of "Taking a Personal Interest in Customers." How he does it is told in this issue. Don't forget to give his story a few moments of your time.

From \$120.00 to \$50,000.00 in 3 Years.

Lew Harrison is the sort of a fellow that tries to do just a little more than you would expect. This attitude and a strict adherence to "One Price to All" method has helped him sell 500 cars in 3 years. Sounds like romance? Yes—and when you read the story you'll say it reads like romance, but we have it from Lew's friends that "it's straight goods."

Give Them a Ride.

Perhaps you have staged one or two good stunts to get prospects into your sales room but did you ever try promoting a contest combined with a "Ride Week?" One enterprising member of the trade has pulled off this combination in wonderful style—but we'll let the article on page 13 tell you how it can be done.

An enduring Plug-

NE GLANCE will show you its sturdy steel shell, the twin-point fan-shaped electrode, the petticoat style insulator with its heavy porcelain body.

Little wonder that it withstands the heat and pressure and delivers service month after month, year after year, through hot or cold weather.

Built to outlast the car—strictly high grade materials and workmanship, a quality article in every way. MP Spark Plugs sell on sight and make new customers every day, and their merit is proved by the tremendous increase in demand.

MOTOR PARTS COMPANY

15th & Mt. Vernon Sts.,
PHILADELPHIA

To a few firms or individuals who can qualify as distributors, we can offer an unusual proposition in certain territories.





Bottom View

This view shows several exclusive features — fan-shaped twin electrodes, amply recessed porcelain insulator and positive ground to the shell.





 $S^{\rm ELECTING}$ the site for your garage is like choosing a watermelon. If it's broad daylight and the farmer and all his family, including the dog, have gone to camp meeting, everything is lovely, but if you pick it at night you may get a green one. Try all the tests you can think of on your garage site, look at it from every possible direction, and keep your eyes wide open so that you don't get a "green one."

You know the garage business and are the one who is taking the chances and paying the bills; don't let some overzealous real estate man, who may be cleaning up a thousand dollars on the deal, hypnotize you into thinking the lot is more valuable than it is. Size it up for what it is worth to you; not for what it may be worth to a butcher or a dry goods merchant. You might buy a good garage location for a song comparatively, because it would be of no value in any. other line of business. Remember the watermelon you picked in the dark and this time keep your eyes open.

When they select the site for another link in their chain, one of the largest, if not the largest chain stores company in the country, stations a man at the agination call on your architect to make a perspective drawing. It may save you a mistake

proposed site to count the people that pass, not in a day or a week but a month. The numbers are registered by hours throughout the day and when the count is complete and a decision is to be made the compilation is weighed against other similar compilations made for other sites in the vicinity. Thus it is seen that the price to be paid for the lease on any of the proposed sites can be computed to a nicety and the amount of business the store will do estimated long before it is opened.

Choosing the garage site should be done just as carefully and with just as much regard and cognizance of passersby as in selecting a chain store site. In fact one must use more discretion than

the chain store promoter because he has the rules deduced from the successes and failures of a hundred other ventures behind him to guide him in his selections.

In the present instance the passers-by to be considered are motor cars instead of pedestrians and it is just as important to note the quality and type of the cars as it is in the chain store case to know whether the passers are men or women.

But first let's start at the beginning. There are garages and other kinds of garages, all called the same, but in reality all different and only one type of them really deserving the name garage.

Start with the service station. It requires one kind of a location. Then there is the uncontaminated salesroom seldom seen except in the large cities; then the combined sales and service station. Most sales and service stations sell parts and some have accessories.

Does No Repair Work

Taking up another lead we have the pure, unadulterated garage, correctly so-called, which performs the same function for the motor car that the livery stable of the past did for the horse. Spaces are rented by the month, transients housed, cars washed, oil and gas sold, but little or no repair service rendered, another type seldom met outside the big cities but the most common of all these.

So on down the line we have battery service stations, tire service stations, electrical equipment service stations, repair shops and combinations of any two, three, four or any number of the preceding types. Finally, and probably the most numerous of all because rampant in every small or medium sized town there is the general garage which does or tries to take care of all the lines before mentioned in a space anywhere from 30x50 up to 200 ft. sq. and larger.

Knowing the type of business one is fitted for and feels confident of succeeding we come to the real business of selecting the site.

The location of the real service station where only one or two makes of cars or trucks are handled is very immaterial as all the owners of these makes will know where the station is or make it their business to find out.

A GARAGE site is worth just as much to you as the business it will bring you; not a cent more. Marshall Field & Co., in Chicago, could afford to and have paid \$10,000 a foot for frontage on State street. They know by experience that the location backed by their reputation will deliver the goods. They would rather pay \$10,000 a foot on State street than a few hundred on South Clark, because the business they are after is there.

It is cheaper for you to locate where motor car traffic exists. If you try to bring trade out of its beaten path to you, you must offer inducements and inducements of whatever nature are expensive; they cut into your profits.

The general repair shop is different. It should be in or near a neighborhood inhabited by car owners, the kind where half or more of the homes have a private garage beside or in the rear of them. If the owner of such a shop can locate so that he is on the main artery leading from such a neighborhood to the city it is fine. If the said artery happens to be a national highway or an interurban pike he will be much better fixed because he will not only have the steady, unfailing, all-the-year-round trade of the neighborhood but the catch trade of the tourists or inter-city traffic as well. Oil and gasoline filling stations do especially well in such locations.

The public garage is a big city specialty and thrives on the main avenues adjacent to apartment districts. It also does well in the downtown districts where it furnishes day storage to suburbanites and night storage to tourists and transients; locations near the principal hotels are good though congested streets are to be avoided. Residence districts though good for repair shops are no place for the public garage.

Specialty shops, battery—electric—radiator—tire, etc., do well where they can cater to the trade in a certain district, though with them it is a question of getting known and delivering the goods after they are known, more than of location.

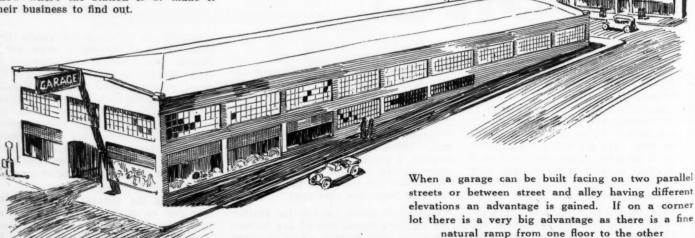
Salesrooms in small towns should be on the main street and in the large cities must be on "motor row" unless in some outlying district where there are numerous public garages in which case the more central the location the better.

After the district has been settled upon and we get down to the question of actual building site there is no doubt but that for sales and service stations and general garages the corner lot is by far the most desirable. The frontage of an inside lot is so limited that in the general garage cars or accessories have to suffer from lack of display while with the sales and service combination the sight of numerous cripples coming in and going out past the salesroom doesn't help to enthuse the would-be customer. Then, too, it is much easier to fit a good usable building to any sized lot if it is on the corner than is the case with an inside

Inside Lot for Storage Garage

The storage garage on the contrary is better off on an inside lot than any other. With it the economical use of space is a prime factor, there is no front window space needed for display outside, perhaps, of a small line of accessories and tires. All that is wanted is a straight aisle from front to back with spaces marked off on each side for the placing of cars. If one of these rows of cars backs up to a side street nothing is

Mediali



he

on of out nd far an ral fer les of ng to en. ble the ide

is s a

ow

er-

and

ght

ces

ing

ars

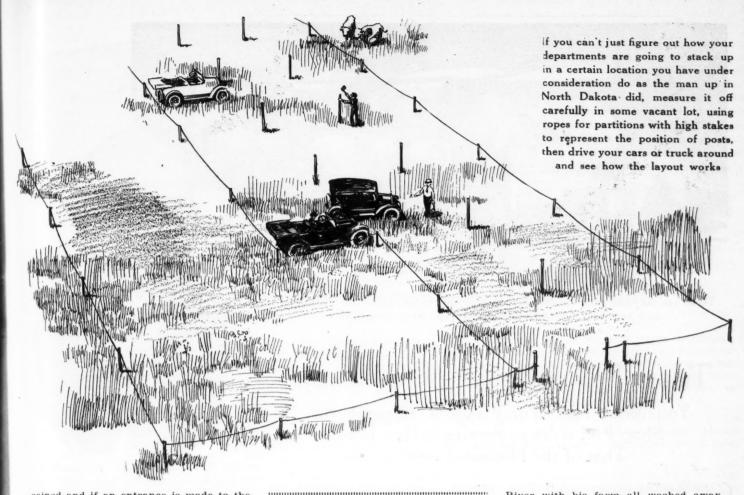
is

allel

rent

rner

fine



gained and if an entrance is made to the side street it costs the garage owner two car spaces or from \$12 to \$40 per month in possible revenue.

In hilly cities and towns advantage can well be taken of two parallel streets having a difference in level of from 10 to 14 feet making it possible to build through from one street to the other with entrance to lower floor on one street and upper floor on the other. Here, too, a corner is a big advantage.

Make Tentative Plan

For all garages, general or otherwise, where cars are to be stored plan to have a clear space 48 to 53 feet wide and as long as desired, this is the most economical width. If narrower, car movements are restricted and cramped and if wider, the space is wasted. Where ramps are used to reach other floors from 8 to 14 feet must be added to the width. One ingenious person that we know of laid out his plan on his proposed site driving stakes to locate parts and stretching ropes to represent partitions. Then he took different sized cars and drove them around to see if everything was practical before definitely deciding. Sometimes this cannot be done owing to secret negotiations or the property containing other buildings, etc., but a similar location may be found somewhere in the suburbs or country where the experiment may be tried. Don't fail, however, to carry a mental picture and some actual measurements of your surroundings.

Sites for garages specializing on tire and accessory sales are best found on

CORNER location should be se-A lected for a general garage if at all possible. Then the corner show window can be used for cars while accessories and parts may be displayed to good advantage on both main and side streets. If a small or comparatively small place is desired all service and garage business may be done on the side street and you have in effect divided sales and service. With larger buildings, where frontage space can be spared, it is sometimes desirable to have a front entrance.

main traveled thoroughfares where thousands of cars pass daily and where the motorist may stop and make a purchase without going out of his way. On some such thoroughfares in cities traffic is one way in the morning and the other at Try to ascertain when the night. heaviest buying occurs and locate on the right side of the street to get it. A driver is very much averse to crossing over against heavy traffic and probably will stop at a place on his side.

When you locate on some thoroughfare to get the benefit of the heavy traffic be sure that it is not so situated, perhaps at a turn, that some wise promoter can build a cut-off leaving you and your business high and dry like the sod hut of a farmer on the banks of the Missouri River with his farm all washed away.

In locating a garage in a residence district keep the building in harmony with the houses surrounding it and get enough land to set it back from the street so that you may plant some shrubbery around it. In this way it will improve rather than hurt the surrounding property and everyone will be happy; your extra money will be well spent buying good will.

A garage site is worth just as much to you as the business it will bring you; not a cent more. Marshall Field & Co., in Chicago, could afford to and have paid \$10,000 a foot for frontage on State street. They know by experience that the location backed by their reputation will deliver the goods. They would rather pay \$10,000 a foot on State street than a few hundred on South Clark, because the business they are after is there.

Locate Where Traffic Exists

It is cheaper for you to locate where motor traffic exists. If you try to bring trade out of its beaten path to you, you must offer inducements and inducements of whatever nature are expensive; they cut into your profits.

A corner location should be selected for a general garage if at all possible. Then the corner show window can be used for cars while accessories and parts may be displayed to good advantage on both main and side streets. If a small or comparatively small place is desired all service and garage business may be done on the side street and you have in effect divided sales and service.



Shop Full if Your Service is Run Like
That of the Hudson-Jones Co.

CLEANLINESS and order, backed up by efficient office records and a loyal organization of shop mechanics is the formula which has made the service department of the Hudson-Jones Co. a leader in selling service.

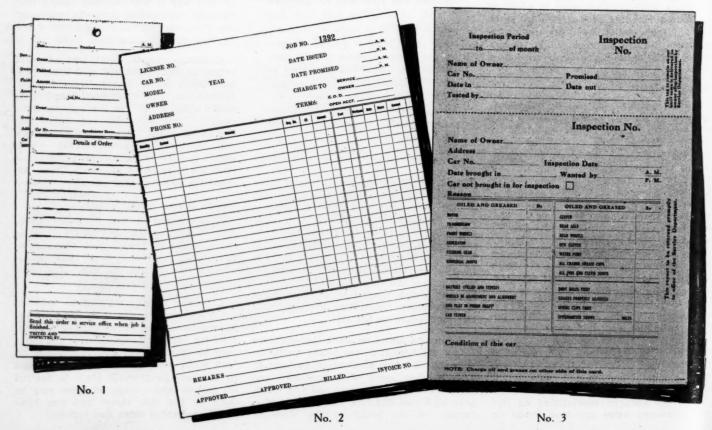
D. P. Graves, service manager for the

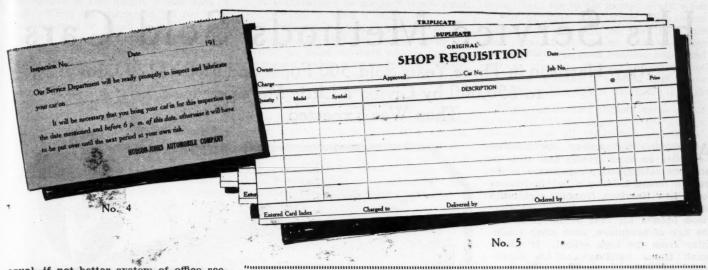
concern, gives to office records the credit which is due them, but lays stress for the success which his department has made upon the maintenance of a loyal, intelligent, thoughtful-of-employer-and-customer-force of mechanics.

From the above it must not be consid-

D. P. Graves, service manager of the Hudson-Jones Co. who makes it a point to try to see every car owner that comes in

ered that the Hudson-Jones Co. is not mindful of records. Far from it. As a matter of fact this company has the





equal, if not better system of office records, of any service station in Des Moines. But Graves believes that records are only one link in the chain and that the records must be backed up by factors equally as important.

Probably the most outstanding feature of the Hudson-Jones service shop is its cleanliness and order. Some Iowa service stations, like others in various parts of the country, are still running on the blacksmith shop idea, but not Hudson-Jones. Cleanliness is the order of the day in the shop. In the first place the mechanics on the receiving floor are given clean suits every day. The men working in the shop get clean suits twice a week and the suits for all men are kept clean at the expense of the company.

Clean All the Time

the

Two porters are on the job all the day and are given orders to "porter" all the time. Tools are not left scattered over the floor and dirty, oily rags and waste are for the particular attention of the porters.

"There is nothing disgusts a motor car owner any more than to bring a clean car into the shop for repairs and on taking it out again the first thing he finds is oil on the seats, or gathering dust on the fender," says Mr. Graves, and for this reason, when mechanics in the Hudson-Jones station are working on cars the seats and fenders are protected with covers.

Graves came to Des Moines from Kansas City about seven years ago. He had been in the employ of Mr. Jones when the latter was manager of the Kansas City branch of the United Motors Co. At that time Des Moines wasn't strong on service stations and the Hudson-Jones Co. has been a pioneer here in efficient, legitimate service station development.

Graves believes that owners want personal, efficient service and are ready to pay for it. He has found that when you give this service you don't have to worry very much about keeping your shop busy.

When the selling of service was still (Continued on page 36)

How the Service Forms Shown on These Two Pages Are Used

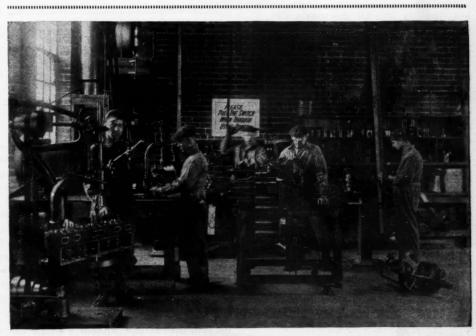
The shop card (No. 1) is a two copy affair, the original of which is ordinary weight paper and the duplicate which is attached to the car being cardboard. Originally a shop card $8 \times 10\frac{1}{2}$ in. was used in all cases, but since stationery and printing costs have mounted so high a much smaller card, 4×10 in. has been developed which will meet most demands, although the larger card is still used on jobs where there is a maximum of instructions to write.

The shop card number is governed by an envelope (No. 2), in which the entire record of each job is carried. The face of the envelope carries the complete instructions contained on the shop card, and the final records after materials and labor billing is completed.

If there is oiling and greasing to be done in connection with the job a separate card (No. 3), is made out to cover this work. The oiling and greasing card is of a bright red color so there is no chance of mechanics overlooking this feature of the work and every item must be checked with the mechanic's initials.

Where customers have regular monthly oiling and greasing a portion of the red card is made up in postal card (No. 4), form, and four days before the date for the car to come into the service station a postal card is mailed to the owner advising him the date his car is due.

The requisition or stockroom order (No. 5) is a triplicate copy form.



A corner in the machine shop of the Hudson-Jones service station, showing the relative position of the machine tools. Note the engine block, partially cut away which is used as a jig for bearing and connecting rod work

His Service Methods Sold Cars

Lew Harrison in Three Years Sold 500 Fords and Made \$120 Grow to \$50,000 by Giving a Little More Service Than Was Expected

A RECORD for selling 500 automobiles in three years, and with no previous salesmanship experience, is the unique record held by a boy in Nashua Iowa, Lew Harrison, from his eighteenth to his twenty-first year of age. Mr. Harrison opened his first public garage at the age of seventeen, soon after graduating from the high school. It was a small frame building and his capital was only \$120 at the time. The next year he took the agency for Ford cars for his territory.

The next year, 1917, he built a large,

The next year, 1917, he built a large, strictly up-to-date garage in a promi-



At the left is the Ford Home Mr. Harrison started with. His capital at that time was \$120, and above is one of the buildings his business built. It is strictly up to the minute in its accessories and departments. Mr. Harrison, in the oval inset above, always impressed his customers with the fact that his garage was the home of their cars and encouraged owners to bring them in often for looking over, adjustment and

advice as to the proper operation

nent locality with all the points and accessories for a most convenient and modern garage, with a womens' room, large showrooms for his different cars, storage room, large repair department in the rear, etc., and also put a phonograph to furnish music in the womens' waiting room, and with the stockroom completely furnished with cubbyholes and shelves for all repair parts, with a sample on the outside of each.

\$120 Grows to \$50,000

The following year Mr. Harrison bought out another large garage a block from his. Throughout this time he cleared each year ten per cent net profit on car sales and garage service. Mr. Harrison sold both his garages and at that time he had to his credit as profit on his sales of 500 cars and his two garages an even \$50,000, so that from the time he started at the age of seventeen with a capital of only \$120, until he was not quite twenty-two years of age he had increased his capital to \$50,000.

When asked in regard to his methods of salesmanship Mr. Harrison was somewhat puzzled as he has been much too

HIGH SPOTS OF SUCCESSFUL SERVICE

He never cut prices on sales of car or service repairs.

He encouraged customers to bring their cars to him every week or so to be sure they were in good running order.

He considers the master sheet method the best for repair work costs.

Whenever a car was left with him while the owner was shopping he would have it oiled and adjusted.

He says that it is usually the women in the family who give the final decision as to which car will be bought.

busy to think of methods. But he has them, nevertheless, and good ones, too. He said that almost without a single exception in his car sales to a family man the final choice of a car and decision to buy has been left to the farmer's wife and often to the girls in the family too. Often the farmer in the field working will say: "Well, go up to the house and whatever the missus says goes with me."

Whenever a farmer came to Mr. Harrison's garage to see about buying a car. Mr. Harrison told him to get into a car and they would drive out and get all his family and bring them to the garage to look at the cars and when there Mr. Harrison would fully explain the car and its repairs and other details and then he would take them home in the car and he said they nearly always bought it.

The Home of Their Car

Another prominent method that proved to be a great help to him was the service that he always offered. When Mr. Harrison had sold a car that was not the end of the deal with him. He told the buyer that when he, and particularly the women of the family, drove into town alone, to make his garage the "home of their car," and in fact, his first garage was named the Ford Home.

And he would look after their car while they were shopping or visiting and grease it and adjust it and look it over. When the women called for it he was on hand to crank it for them. If they left town for a few weeks he gave them free storage for their car while away. So that in this way he gave considerable free service and for some time.

Mr. Harrison remarked that it was very hard to sell closed cars at first and especially to farmers, but that now it is much easier to sell them and he predicts that in five years' time nine-tenths of all cars sold will be the closed type. One of his principal reasons given for the advantage of a closed car is that in this locality three-fourths of the time

it is cold enough to make it much more comfortable to have a closed car.

Mr. Harrison attributes some of his success to the fact that he has never cut prices on sales of cars or service repairs and that it came to be fully understood that there was strictly only one price to all with him.

Master Sheet Should Be Simple

He considers a master sheet for repair work a good plan provided it is simple, but that many of them are too complicated and thereby take extra time and help in bookkeeping that is unnecessary in the garages of smaller places. Mr. Harrison encouraged his patrons to bring their car to his garage every week or so at first, and while they were learning to drive it, so that he could look it over for them and make sure that all parts were in good running order and the car properly greased and cared for. He tried to make it a point that every car sold by him meant one more booster.

When buyers and visitors came to his garage he showed them over the garage, showed them all the different cars, explained them, explained the repair department, and gave them a cordial invitation to call again and to leave their cars there if they were caught in the rain at any time.

How a "Ride Week" Helped One Illinois Dealer's Business

THIS is the way C. H. Williams & Son, automobile dealers at Bloomington, Ill., inaugurated a Spring campaign for business. A "Ride Week" was decided upon and free rides were given for four days, March 17, 18, 19 and 20. Prizes of \$75, \$50 and \$15 were offered in a guessing contest and every person who took advantage of the free ride was privileged to participate in the drawing.

In addition to this a contest among the drivers was arranged and \$15 given to the first prize winner and \$10 to the second. Five points were awarded for the name of each prospect turned in. Twenty-five points for the name of a prospect who expects to buy a car before May 1. One hundred points for the best economy record in handling the car during the four days of free riding and 500 points for each sale. Drivers took hold of the plan with enthusiasm and turned in hundreds of names and prospects.

Rules governing the various contests were issued and cards supplied to be filled out at the end of each day's run. Follow up cards were sent to each prospect and these had excellent effect. The general campaign was in charge of W. E. Drummond, manager of sales. The results were ahead of expectations.



S

u

id ie

at

as

en

Te

r-

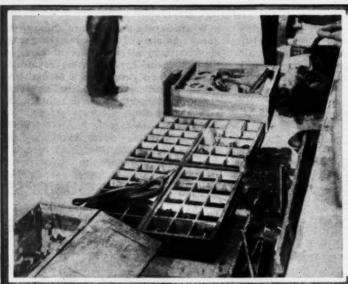
ve

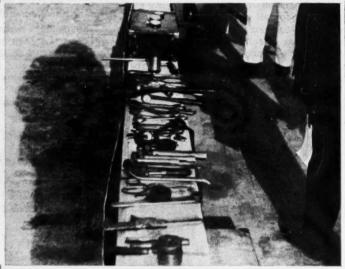
he nis ne. Three of the things necessary to stage a "Ride Week" contest The driver's record card is shown at the left, while at the top is a reproduction of the follow-up letter sent to prospects by the dealer. The contest coupon entitled the holder to participation in the drawing for prizes

C. U. WILLIAMS & SON CO. Automobiles & Tractors ALAMO FARM LIGHT PLANTS Trucks BLOOMINGTON, ILL. Saturday you had a ride in the CVERLAND FOUR. There was absolutely no obligation connected with it, you were our guest and as such we appreciated the opportunity to demonstrate the Neither will there be any obligation attached to the returning of the enclosed post card. We want your honest opinion as to the car, particularly as to its riding qualities. Please give us your impression in 15 or 20 words, and mail the card to us today. Yours very truly, CONTEST COUPON You May Win One of These Prizes! THE DESCRIPTION OF THE PRIZES I PRIST 457.50 to be allowed as the street of any new or used our new or used ou 315.00.

d to our store SATURDLY EVENING, MARCH 20th, for the big also Saturday evening iolification of missic, movies and entertailment. If they have no cards, they can be obtained from the driver of any car. ate and be on hand with your number C. U. WILLIAMS & SON CO., Bloomi
This is "HAVE A RIDE" week—se "Ha ncing from 9 to 10, this ticket will admit you. REGISTRATION CARD No. 501 Address be in the market for a new car by June 1, 1920. IT IS UNDERSTOOD THAT THIS REGISTRATION DOES NOT OBLIGATE ME IN ANY WAY Name Driver ...

A Lesson from the Race Track Pits That Might Be Applied to Service Methods





Automobile races often are won or lost at the pits. If when a driver comes in for repairs or adjustments and the necessary tools are not immediately at hand, he may lose the race as a result. Of course, it is not so important that car owners when they come into a service station for repairs or adjustment be attended to with lightning speed, but certainly it is desirable to have all tools and equipment ready for the job. The above illustrations show how the tools and parts are arranged in the pits, from which perhaps a few lessons might be learned. There is nothing like being ready to do the job, whether in a race or service station

How the Cleveland Cadillac Co. Keeps In Close Touch With Its Customers

THE term service means so many different things that it becomes quite a difficult matter to decide just where to draw the line. When you adjust the carbureter or tune the ignition of a customer's car, that is service. Also, when you tow in his wrecked car and rebuild it, that is service. Washing cars, oiling and greasing them, installing a spot light, putting a new glass in the windshield, all are service operations. But there are other forms of what might be called subtle service.

Take, for example, the reproduction of the letter herewith. The Cleveland Cadillac Co. did not have to send out these letters had they not been so inclined, nor did owners expect to get such letters. But it is pretty safe to say that every owner who received one of them said: "That's nice of them to call my attention to this," or words to that effect. It is just a case of remembering your customers long after they have purchased their cars. Every one of them is a potential buyer of a new car some day and these little subtle methods of selling your service will be a big help in selling him again.

T. H. TOWELL PRESIDENT & TREASURE



The Chencland Cadallac Co.

CADILLAC BUILDING, EUCLID AND TWENTIETH

CLEVELAND

March 24, 1920.

The time for taking out your 1920 automobile license will expire March 31st. The S. A. E. rating of a Cadillac Car is 31.25 H. P. and the license fee is \$12.00.

When applying for license it is necessary to give your engine number only as there is no separate Chassis number on a Cadillac Car.

If you haven't attended to this very important matter, it is well to do so at once. If there is anything further that we can do to assist you, it will be a pleasure to do so.

With best wishes, we are,

Yours very truly,

THE CLEVELAND CADILLAC COMPANY

Dan J. Nolan,

Vice Pres. & Gen. Mgr.

A Worth While Instruction Book

Much Unnecessary Service Work Can Be Eliminated by Furnishing Automotive Vehicle Owners With a Reference Book Easy to Read and Understand

NLESS the factory does its share in helping the dealer to give the right kind of service on a car, truck, tractor, or whatever he happens to be selling, automotive apparatus is apt to fall by the wayside. Manufacturers are realizing more than ever that much good can be done by the factory itself in keeping its product running right. Among other things, the instruction book that accompanies a piece of automotive apparatus, or should accompany it, can be worked out in such a way that it will cut down to a great extent what we ordinarily call service work.

Many instruction books have been brought out which, while they have the necessary information in them, are so badly gotten up that the information cannot readily be found. In such cases the owner of a car or tractor simply takes for granted that the book cannot tell him anything and he eventually forgets all about it.

One of the common faults of compiling an instruction book is that of placing a diagram on a certain page and having scattered all through the book references to that diagram. This means a constant turning of the pages, and by

complete instruction book

is recognized and the Case company

sends out additional information

from time to time to be inserted in it

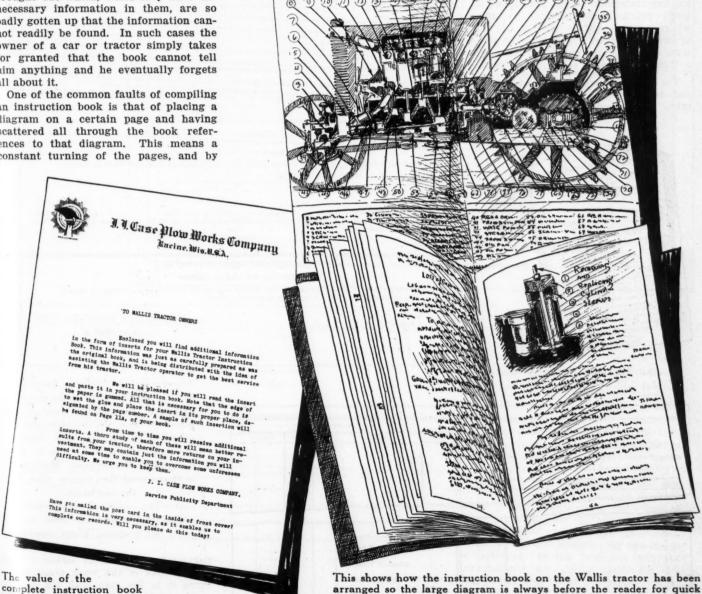
and by the reader gets tired of his job.

The illustration on this page shows how the instruction book that goes with every Wallis tractor is gotten up. It will be noted that the large wash drawing showing a sectional view of the tractor is fastened to the top of the book and when spread out the leaves of the book can be turned and no matter what page the reader happens to want, the drawing is always before him. Furthermore, this drawing has numbers on it with a reference, so that if a certain part is mentioned on any page, a glance at the chart above will show it. A letter goes with each instruction book, a reproduction of which also is shown herewith.

It is quite certain that the recipient of this instruction book will be inclined to study his tractor thoroughly and by having covered every point necessary in tractor maintenance, it stands to reason that there will be less inclination for the farmer to call on the dealer or distributor for every little difficulty that might come up. So, before you turn loose a customer with his new car or tractor make sure that his instruction book is going to be of real value to him.

reference, no matter which page is being read. The value of the instruction book is in this way multiplied and makes it possible for

the owner to more readily understand his tractor



Working to a Master Sheet

Has Simplified the Service Work Recording of the Yellowstone Motor Co.

A WORK order and master sheet that is working out very well in the service department of the Yellowstone Motor Co., Pocatello, Idaho, was planned and installed by John W. Fowler, assistant manager of the concern. By his method of making out repair orders much time is saved, inasmuch as the clerk or service man taking the order merely has to jot down the number corresponding to the operation on the master sheet. Thus, instead of having to write out the words "Adjust or repair oil pressure or sight feed" he writes the number 16 in the space on the order card. Here is how Mr. Fowler describes the system:

When a customer comes in our service superintendent meets him, takes his work order, sends original to office, where same is put in the file of work orders in progress along with the envelope, and hangs the carbon on the car in a leather case with transparent front.

The mechanic starts work on this car and as he needs material or parts he takes this case with him to proper de-

	asm.	Tour land		
	REPAI	R ORDE	Q No 99	A
131:	Sen in hy	of an	TIME	
244	COOTES STATE	Can Grans Prope		
1 11	MARIS AND IN	haptern.	oche.	

Leather case for protecting repair order which is hung on the car

					LL							_										FFIC	-			
DO NOT								CA	RV	WIT	но	UT	CLA	MIM	CHI	CK	BE	ING	o. Ti	me.	BYC					. ?
From	OWNE	R				. 8.0		Da	te.					-												
HI											M	ake	ot	Ca	r	*****					*******					
Address					M	oto	r N	0									S	eria	I N	0		*******				***
Phone No											τ:	con	e l	Vo.							*****					
Taken in by	*********	*******		**** *	******	*****					L	cen			12			ir v	vor	k as	ner	the	mas	ster		
Taken in by The classific	sheet;	s, nar	nes a	nd i	num	bei	rs li	ste	d o	n t	his	sh	et	inc	d o	ne r	epa	bef	ore	sign	ning.					
	sheet;	cus	tome	rs n	nust	se	e th	iat	1151	1 13	-	mp	-	ai	-	-	Lil	1.	1	121	· LT	v	1,	vT	V	N
72	V	4	. 4		4	4	,	4	4	_	4	4	-	4	- 4	+	1	+	+	++	+	-	1	T	1	1
A Motor					1	Н	+	+	H	-	H	+	-	Н	+	+	H	+	+	++	11			1		1
A M B Elect. System					-	H	+	+	+	-	H	+	+	H	+	+	H	+	+	1	1			T		1
B E C Trans. & Clutch					+	H	-	+	+	-	H	+	+	H	+	+	H	+	+	+	1					
C Tr D Universals					1	H	-	+	+	-	H	+	+	H	+	+	+	+	+	11	1			П		1
D U E Differential			1		1	H	-	+	+	+	H	+	+	+	-	+	Н	1	+	11				П		
F Die F Steering	1		-		4	H	-	+	+	+	H	-	+	+		+	H		+	+		1				
F Ste G Chassis	11	-	1	-	4	H		+	+	+	H		+	+		+	+		+	T				П		
G Ch H Misc.			FORE	_	Щ				_	-		240	-	461	WOF	K F	RO	CEE	DS	_						
Please ma ALL REI		abo pa AR	ve re	pair nd l	agi D.	ree	to	ustr pay	ner fo	nts or s	to	my ie u	ca	r, f	urn	ishi leti	ng on	the of	ne wor Es	cess k. STI	MAT	mate res	rial GI	VE	nd :N	
				_	_	_	-	_	_	_	_								_							T
771			rk ex	am		, ca	ar t	este	ed o	out	, p	ron	oun	cec	0.	K.	an	d re	ad	y fo	r de	liver	у			
This job is finish				Ti	me																					
Date	*******																				SHO					

	MATERIAL USED			LAB	OR		
unless this	Room man will issue no parts to card is presented and charge m k, by stock room man.	Date	NAME	Ref.	Time	Amount	
No.	DESCRIPTION *	Price					
				Labor Total		*********	
				Material Total Grand Total		••••••	

OFFICE O. K. By.

Above—Repair Order. Instead of writing out the work to be done on each job, the master sheet is referred to and the number corresponding to repair work ordered is written in the line A, B, C, etc., designating the division. Much time is thus saved the service man and the mechanic.

Nº 99.7

Left—The material used card on which the stockroom man writes down all material given mechanic

partment and the head makes a charge on the back of the work order and returns it to the man with the part and at the same time makes out a regular charge ticket to job number. He sends this to the office along with all regular

HANG UP IN SHOP, STOCK ROOM AND OFFICE The MASTER SHEET of YELLOWSTONE MOTOR CO., Governing Repair Work.

The master sheet which is referred to by the service man and who uses the number to designate on the repair order what work is to be done. This sheet is hung up in the shop, stockroom and office or wherever there is need to refer to it. This has been the means of simplifying service work bookkeeping and elimin-

ates a lot of writing

nd

ar

ds

The MASTER SHEET of YELLOWSTONE MOTOR CO., Governing Repair Work

1	A-MOTOR	
1		5. Take lost motion out of axleshaft
1	1—Adjust connecting rod and main shaft bearings—renew as needed.	8 Pemedy greece leak from rear wheels
1	2—True up stems, turn valves, ream seats and grind. 3—Clean crankcase and put in fresh oil.	6—Remedy grease leak from rear wheels. 7—Repair differential.
1	4—Adjust timing gears, bearings, bushings and shafts.	8Furnish and install any parts needed.
1	5—Adjust camshaft bearings.	
1	6—Examine piston rings—renew as needed.	F—STEERING GEAR
1	7—Examine piston pins—renew as needed.	1-Adjust steering gear and lubricate.
1	8-Examine cylinder walls and pistons for scores and wear.	2-Adjust and lubricate steering reach and cross rods.
1	9-Micrometer pistons and cylinders for clearance.	3—Grease and tighten steering king bolts.
1	10-Repair or renew pistons as needed.	4—Renew steering king bolts or bushings.
1	11-Repair water pump.	5-Furnish and install any parts needed.
1	12-Repair oil pump.	C CHARGIS
1	13-a-Examine and repair cylinder head, intake and exhaust gaskets	G—CHASSIS
1	b-Examine crankcase, valve cover and oil pump gaskets.	1—Examine all wheel bearings—grease and adjust properly
1	c-Examine all water inlet and outlet gaskets.	2—Line up front wheels.
ì	14—Examine all water hose.	3-Grease and tighten all shackle bolts-renew any worn shackles
1	15—Adjust spark and throttle control.	and bolts.
j	16—Adjust or repair oil pressure or sight feed.	4—Tighten all spring clips.
1	17—Clean outside of engine and paint.	5-Lubricate all brake linkage-remedy any lost motion in clevis
i	18—Tighten or renew fan belt.	pins and rod bushings.
1	19—Adjust valve lifts.	6—Tighten body bolts.
į	20—Clean carbon.	7—Tighten engine and bed bolts.
- 1	21—Adjust carburcter.	8—Tighten fender and running board bolts.
1	22-Furnish and install new motor block or any parts needed.	9—Adjust body doors and locks.
1	B-ELECTRICAL SYSTEM	10—Tighten muffler and renew if needed.
1		11—Clean gasoline tank and tighten brackets. 12—Repair gasoline tank.
-	1—Clean and adjust spark plugs.	
1	2-Clean distributer-true up in lathe.	13—Repair gasoline gage. 14—Examine gasoline line and connections.
-	3—Clean and adjust breaker points—renew if needed.	15—Clean rust from tire rims and paint with graphite and water
ì	4—Clean generator and true armature—renew brushes as needed.	mixed.
1	5—Clean starting motor—true armature—renew brushes as needed.	16—Adjust and-tighten tire rack.
1	6—Clean and adjust horn.	17—Repair tire rack—renew if needed.
1	7—Repair or adjust starting motor.	18—Tighten running board boxes, engine pans, fenders, etc.
i	8—Test storage—fill with distilled water. 9—Clean and tighten all binding posts and wire terminals.	19—Reline foot brakes.
į	10—Focus head lamps—Clean reflectors.	20—Reline emergency brakes
	11—Install bulbs as needed.	21—Staighten fender.
	12—Adjust or repair generator to charge correctly.	22—Install new fenders
	13—Install new wiring as needed.	23—Repair radiator.
	14—Furnish and install any parts needed.	24—Tighten rim bolts.
-	14 Turnish and motals any parts needed.	25—Repair springs—renew if needed.
	C-TRANSMISSION AND CLUTCH	26—Adjust brakes or repair.
1	1—Examine clutch leather—Clean and soften as needed.	27—Straighten axles.
	2—Lubricate clutch shaft, clutch control levers and clutch collar.	28—Install new gas tank.
	3—Adjust clutch pedal.	29-Install new or repair emergency brake latch rod.
	4—Tighten transmission on gearshift lever.	30-Furnish and install any parts needed.
	5—Renew oil in transmission.	II MICCELL MERCIA
	6—Renew transmission felt washers as needed.	H-MISCELLANEOUS
	7—Remedy slipping clutch.	1-Clean vacuum tank and repair-Install new if needed
	8—Remedy grabbing clutch.	2-Repair carbureter-Install new if needed.
	9—Furnish and install any parts needed.	3-Repair top and curtains-Install new if needed.
	o raman and motan any parts meeter	4—New light in rear curtain.
	D-UNIVERSALS	5—New top boot
	1—Renew pins, bushings, yokes, etc.	6—Repair upholstery.
	2—Lubricate pins and bushings with heavy oil.	7—Renew or replace tonneau carpet.
	3—Pack universals with grease.	8—Recover running boards.
	4—See that distributor cover is set tight and permanently.	9—Recover toe boards.
	5—See that universal joint flange bolts are tight and wired.	10-Repair, thighen and adjust windshieldInstall new if needed.
	6—See that grease plugs are tight.	11—New glass in windshield or sedan door.
	7—Furnish and install any parts needed.	12—Repaint car.
	/ urnish and histan any parts needed.	13—Renickle all metal parts. 14—Testing.
	E-DIFFERENTIAL	14—Testing.
		15—Delivering and teaching—shifting company cars.
	1—Examine adjustment of different al gears.	16—Demonstrating.
	2—See that all differential and pinion bearings are in perfect condition	
	and adjusted properly.	18—Errands
	3—Renew oil in differential.	19—Dress upholstery and top.

Address			Date Received Make of Car							
MATERIAL AND PAR	TS	LABOR								
io. Description	Price	Data No.	Name	Ref. Hrs.	Amount					
					-					
,										
TOTALS										
		11								

This is a record of everything that has been done to the car and charges are made up from these figures

charges. This charge is placed in our work order file along with the proper envelope.

At night the mechanics turn in their time slips to foreman, who enters them on the back of proper work order cards, then sends these time slips to the office where they are segregated and placed in our file along with the proper work orders. Next morning the bookkeeper posts all material and labor on the face of the envelope and puts the charge tickets and mechanic's time slips inside of the envelope.

Keeping a record charge or time slip for everything that happens to this car while in our shop and at the close of the job the face of the envelope shows itemized list of material and labor done, sustained by the evidence on the inside of envelope. If the customer has the job charged we merely make out one charge ticket to cover everything, giving the date job is finished, job number, amount of material, amount of labor, and if there is any dispute we can readily look up the record.

Factory Production Methods for the Farm

Texas Dealer Says Agricultural Production Needs Up-to-Date Machinery—Sells Tractors on That Basis

THE methods of the Kibbe Tractor & Implement Co., Dallas, Texas, are typical of the methods of the new blood which is coming into the power farm equipment business in the Southwest. These concerns are new and they differ in both spirit and application from the methods which have been in vogue in that section for upwards of 50 years.

Needless to say they do not at all meet with the approval of the old time branch house managers and distributors. They represent innovations which violate every tradition of the trade and run counter to practices and habits which up to this time have been regarded as permanent institutions.

But the men who are inducting these new ideas into the trade are new men. They are men who have gained their ideas in other walks of life, but who believe they see an opportunity to put modern ideas and modern methods into an old industry.

The Kibbe Tractor and Implement Co. started in business just a year ago distributing the Cletrac and when the year's record was footed this morning it revealed the fact that thirty-five dealers had been secured who had disposed of something like 400 tractors and a miscellaneous lot of other power farm equipment during the year. It is significant too that most of these dealers are of the exclusive type.

"We send out ambassadors, not traveling men," says J. Lee Jackson, sales manager. "It's our notion we have an idea to sell, rather than goods, and so we need diplomats in our employ. You see, once you have sold the dealer the power farming idea he buys the wherewithal to put that idea across, namely, the tractor and implements, without urging on our part."

Sales Policy Well Thought Out

This sales policy is the logical outgrowth of a thought which lay for years in the back of the head of Louis G. Kibbe, the founder of the business. Although a native Texan. Kibbe went east years ago to engage in manufacturing. For many years he was connected with prominent industries there, last with a concern in Stamford, Conn. As a manufacturer, he saw and was impressed by the advantage of labor-saving contrivances, automatic machinery and efficient methods of production.

Always remembering Texas, there persisted with him constantly the idea that factory production methods, represented by improved machinery and efficiency systems, might be applied to the farms of his native state advantageously. He looked upon the farm as a factory and

By FRED M. LOOMIS

he looked at it with a manufacturer's eye. The conviction grew upon him that he had the right idea. Finally closing out his eastern business at the end of the war, he returned to Texas, resolved to put his ideas into execution.

This included the inculcation of the idea of substituting power and factory methods for the old horse and mule methods with which he had been familiar since childhood. This meant also the introduction of labor-saving equipment of the power variety. But he thought it necessary first to sell the idea. Hence the sales policy of the Kibbe company.

Next came the machine. Commencing with the Cletrac tractor as a foundation the company has added to that the Toro motor cultivator, the Douglas



"Selling the right lubricant is a service in itself," says Jackson. The company has had the factory thoroughly test out a line of lubricants which now it is inducing its dealers to stock and sell. The dealer is shown the importance to the farmer of using the right lubricant and he himself is sold on the idea that if he insists upon his customers using the oils he recommends he thereby reduces the trouble the customer encounters and cuts down the number of service demands made upon him, thus reducing his own overhead cost of service and enhancing his own profit.

motor truck, Oliver engine plows and other power tillage tools and the Case power lister. This year other implements will be added until a complete line of power operative equipment will have been acquired.

Other concerns profess similar policies, it is true, but not always do they go about putting them across in such a practical way as does the Kibbe company. An instance or two will illustrate.

"Selling the right lubricant is a service in itself," says Jackson. The company has had the factory thoroughly test out a line of lubricants which now it is inducing its dealers to stock and sell. The dealer is shown the importance to the farmer of using the right lubricant and he himself is sold on the idea that if he insists upon his customers using the oils he recommends he thereby reduces the trouble the customer encounters and cuts down the

number of service demands made upon him, thus reducing his own overhead cost of service and enhancing his own profit. In servicing his customers by seeing that they keep their machines properly lubricated he is insuring himself additional profit. This practical way of putting the matter up to the dealer makes certain its acceptance by him.

But the company goes further. looks beyond the immediate sale. sees its own success dependent upon the continued prosperity of its dealersrealizing that it must fail if its dealers fail. So the policy of the company sees in a dealer merely a man who is beginning and who must be encouraged, assisted and co-operated with. Therefore, the Kibbe company stands behind that man, not only with goods which are dependable, but with ideas, suggestions and plans for extending his business. A Kibbe dealer is considered to be a member of the Kibbe family, entitled to all the confidences and consideration given an intimate associate. He is let in on every good idea the company has.

Everything for Power Farming

The purpose of the Kibbe company in extending its line of goods is to give to the dealer everything necessary for motorizing the farm and at the same time make it profitable for the dealer to handle that line exclusively. The company is looking for young men with vision, who have the confidence of the business men in their respective towns. Jackson says that in nearly every town there is some young fellow whom everyone will be glad to see get ahead and whom the banker in particular will stand behind. The Kibbe company looks for such a one and develops him into the exclusive dealer. Several ex-service men have been so inducted into the trade and are doing well.

Encouragement also is offered in the matter of housing the business. The idea is that the power equipment business is of growing importance and it should have a home in keeping with that importance. The dealer is told that the right sort of business home is a manifestation of business enterprise.

Then this home must be equipped for service and it is impressed upon the new dealer that service to be satisfactory must be rendered promptly and efficiently. He is compelled to carry an adequate stock of repairs. From the very start the company is insistent upon this service idea and makes it its business, not alone to urge the necessity of service but to show the new man how to give it. Again an appeal is made to his business sense.

(Continued on page 36)

S

al

16

y

It

It

he

rs

es

n-

nat

le-

ns

A

m-

all

on

to

mo-

ime

an-

any

ion,

ess

ack-

here

one

hom

for

the

vice

rade

The

busi-

it it

that

t the

nani-

d for

new

ctory

effi-

y an

very

n this

iness,

ervice

ive it.

siness

SELLING SERVICE

Necessary That Both Customer and Service Salesman Spend Sufficient Time on Transaction to Avoid Disputes

THE problem of selling automobile service and selling merchandise are widely different. In the sale of merchandise it is only necessary for the salesman to convince the prospect that the article is needed and that the price is right. The transaction is completed when the buyer is satisfied on these points. In selling automobile service, you are selling something on an article which has already been purchased.

And, the right way is to make the customer realize that it is an important transaction and that it is to the benefit of all concerned for both to spend sufficient time, so there will be no misunderstanding and consequently no embarrassing explanations to make after the repairs are completed.

The selling force should be large enough so that the salesmen have more than enough time to spend with each customer. It is only natural to assume that if the salesman is pressed for time, he cannot give the individual attention to which the customer is entitled. It is this individual attention which all customers look for. There is no reason for keeping a customer waiting to receive his first attention when he comes into the service station.

Tester Gives Full Report

There should be as many service clerks as your business warrants. This information is to be noted on a form, which is afterward to be given to the tester assigned to the job. It is his job to report back to the service clerk the existing condition of the car, the tester noting whether the trouble which he finds agrees with the trouble the customer reported and whether any additional repairs are necessary, but about which the customer has not told the service clerk. A full report is then made out on the form and the customer is notified of the true condition of the car. If a tester is not available, of course there is a little waiting required. The fact, however, remains that the customer has received his first attention immediately and does not roam around as though in a strange land, nor is he at the heels of a service salesman who is engaged with some other customer.

After the tester's report is made out, it is given to the service salesman, to whom the customer is then referred. The service salesman then has something tangible to work on and it is his duty to tell the customer that such repairs are necessary and not merely write up a repair order from the customer's judgment as to what the car requires.

Of course, the customer may not want all the necessary repairs made. The fact remains, however, that you have

By ERNEST V. DERKS

Service Manager, Buick Motor Co., New York

fulfilled your duty by reporting the true condition of the car. Keeping a file of this record gives a complete history of the condition of the car at the time it is brought to the service station, and this will help very materially in settling any questions which may later arise as to work that was previously done, or the condition of the car at some previous time. We keep such a record, and to us it is invaluable.

Have an inviting place in which to receive the customer. The shop also should be kept clean, so that you are not ashamed to bring anyone into it. Another thing which should not be overlooked is the returning of the car in a condition where the customer does not need a pair of overalls to drive it. The upholstery should be cleaned, the car should be washed in most cases; the units or repairs should be thoroughly cleaned. All these things make a good impression.

Comparing Service

Suppose you took your shoes to the cobbler to have them repaired and he turned them back to you with the same mud on them when you brought them there. Or, supposing you took your watch to the jeweler and he turned it back to you with the crystal soiled and finger marks all over the watch, what would you think? You would naturally say that he has done a rotten job. The same thing applied to the service business.

The service salesman is helpless unless the entire organization works in



SERVICE ON THE ROAD

How about the customer who is stuck on the road. He is more inconvenienced than the man who brings his car to you. There should be provisions made to get to the man stuck on the road. To do so a service car or cars should be available, depending on the volume of your business. Without such equipment valuable time is lost. We have realized the importance of this and our equipment is in such shape that it is never more than 20 min. before we are on the road to get relief to some one who is in difficulty. No matter how well you conduct your business for the customers who come to you, if you do not make provision for the customers who cannot get to you, you are missing a link in your service chain

unison. The incoming testers, commonly known as "trouble shooters" must exercise extreme care in diagnosing trouble. In a well managed shop it is of vital importance to see that the work is turned out properly and in the least time. Shop and final testers should be unbiased in the performance of their duties and repair office must keep accurate records of all jobs. There should be no such thing as playing favorite or having "friendship customers," as this is unfair to the public. Furthermore, you are not in the long run satisfying your customer by extending a special favor to him, for the next time he may expect some repairs which you perhaps are not in a position to do immediately, and naturally he feels slighted.

Same Treatment for All

There may be times when you are not in a position to take care of all the cars at the time they are brought to you, and in such cases a definite appointment should be made. This is very much bet ter than taking the car and holding it a day or two before starting work, because the customer may be able to use the car in the meantime. Of course, the shop should be so well managed that you can at all times take in cars which need immediate attention. You will find that by treating all customers alike and making them realize that one owner means as much to you as another, and that all customers should be cared for in their turn, they will respect your method of doing business.

One detail that goes further than anything else in the successful selling of service is the being able to answer the customer's question: "How much will it cost?" and "How long will it take?" Ninety-five per cent of our repair work is covered by either flat rate or estimate. We do not, however, include parts in the quoting of flat rates, excepting in such cases as relining brakes, oiling and greasing of the car and several other items of this kind where we know in advance what material is required on the job.

It hardly is advisable to make flat rates on 100 per cent of the work, as we find that a small percentage of the work is so variable that to make a system which would cover it all would be so elaborate as to be impractical.

To conduct business in a businesslike manner, you should be able to tell just what the labor charges and repairs will cost, and you should also be able to tell what parts will be used after disassembling the units to be repaired. The plumber, the electrician, the carpenter, and in fact, in all lines of business, they will tell you how much a certain job

(Continued on page 36)

Service on a Budget System

"Decrease Expense and Improve the Product" Is the Keynote of Detroit Dealer's Intelligent Plan

DETROIT, April 5—Service efficiency is the keynote of an exhaustive report submitted by Guy O. Simons of the Simons Sales Co., along with a 1920 budget for the guidance of his service department. Manefficiency is the foundation on which the service department rests, says Simons, and without 100 per cent productive effort success can not be obtained.

The problem of decreasing expenses without cost to the finished product has been drummed into the Simons organization and the elimination of all waste, is a subject that has been carried to a degree that to many is looked upon as an extreme. In a talk to his organization at the beginning of the present year, however, Mr. Simons cited facts and figures so clearly and convincingly as to impress upon all the importance of the effort urged.

the enort diged.

Best Machinist Is Too Costly

"I have in mind one man, probably the best mechanic in our employ," said Simons, addressing his employes, "who is in reality the most expensive man on the payroll. There can be no possibility of complaint as regards his work. When he has finished a job it is absolutely perfect and yet he is of far less value to me than a cheaper man and one given to mistakes and less effort to turn out 100 per cent perfect work.

"That sounds unreasonable, but take the figures. I showed this man by actual figures where he had cost us money by failure to turn off his light when he had finished a job and pending the start on another; where he has used a sheet of sand-paper on a job that could have been done with a half sheet, the use of a pound of rags for a job that should have required a half pound; his failure to turn off the water after completion of a job, and other apparently trifling oversights and omissions that in the course of a year reach startling figures."

By his analysis Simons figures that the labor cost of his service department during 1919 was 55.9 per cent of the total sales and his department overhead 34.38 per cent, a total of 90.28.

His budget for 1920 calls for a reduction of 18.7 per cent in the department overhead. And by actual figures and constantly teaching economy in the service station he expects to carry out that reduction scheme.

Weekly meetings of all foremen are held at which Simons goes into all de-

Service on a Budget!

Even the greatest businesses in the world must be run on a systematic budget basis. Business men and theorists alike agree that the adoption of a budget system for the United States, the biggest business enterprise in the world, will mean real economy.

But the budget system is not limited to the big business. It can be well adopted by the smaller enterprise. Read this article and see how it has systematized the service business for one man in Detroit.

tails of the business with them and that information in turn is imparted to the men under them. Nothing is concealed from them. Actual figures to a fraction, in which even the company's gross and net profit are outlined, are given the men

Labor sales during 1919 or, more simply, the work performed by the service department for which there was a cash return, was 79.1 per cent. That figure is cited in the 1920 budget as the absolute minimum. Non-productive labor last year amounted to 20.09 per cent. That Simons insists must be eliminated in 1920. Non-productive labor is reckoned by the time lost by mechanics after having finished one job and while waiting for another. The cure for the ill, Simons says, lies in the foremen who must so regulate the work and the number of mechanics as to keep all of them employed constantly.

There is no intent to reduce salaries or wages in the plan of expense reduction. A fair deal for every man is the motto and Simons contends that elimination of waste and non-productive labor will reach the goal he has set. The problem of increased volume of business enters largely into the Simons scheme.

Has a "Glad Hand Man"

The solution to this is arrived at by efficiency. The first step naturally is the circular letter. But perhaps the most important feature is the "glad hand" man whose sole duty consists of greeting patrons with a handshake and a spirit of fellowship that immediately puts him on the defensive. It is then the "glad hand" man proves his effectiveness. The customer probably has driven in to have a battery charged, but a few minutes friendly chat and an apt suggestion here and there convinces him that several other things are necessary to put his car in first class shape or new parts or equipment and accessories would enhance its value and make for comfort and convenience. Simons employs four "glad hand" men and the service sales that are credited to them more than pay their salaries, at the same time sending the customer away imbued with a feeling that he at last has found the right spot.

The next step after the car is inside is the rigid instruction that first class workmanship must be apparent and no job must leave the station until the car is in absolutely perfect shape, or as nearly so as is humanly possible. Prompt-

ness is one of the big elements and the attractiveness of the repair shop is another. An unclean and dingy repair station with paint and grease scattered about and dirty rags piled here and there combine to keep him away. A neat and attractive shop, on the other hand, where he can walk around without fear of ruining his clothes, where he is impressed with its orderliness, attracts him.

Bonuses For Decreasing Costs

Bonuses to departments reducing the cost of output are held out to the men, who are cautioned to bear in mind at all times that reduction must not be at the expense of the job.

Then there comes the problem of policy material and policy labor as contrasted with guarantee material and labor. Policy material is the replacement of a part after the guarantee has expired, for which the company does not feel itself responsible but at the same time realizes would be good business policy in cementing the friendship of the customer. The same is true with policy labor which means simply an adjustment here and there that brings no return save the good will of the customer.

Curtailing the expense of long distance telephones and telegrams, economizing in the use of heat, water, light and power, stationery and printing, the handling of supplies and the maintenance of company cars are urged and exact figures shown to demonstrate the saving possible from close application of the principle of economy. It is contended the employe in the service department can influence every item of expense save rent and salaries. They are called controllable and the necessity for proper control in achieving the end sought is stressed.

The satisfied customer is the keystone and all the instructions for guidance of the service man are predicated on that idea. That idea, as exemplified in the labor and material policy charge in the year 1919, cost Simons only \$12.24 a

car. That trifling expenditure as compared to the volume of business has meant and will mean thousands in work done for customers drawn chiefly by that policy plan.

Car material and car labor expense also are figured in the Simons plan of policy. That item means the turning over of new cars in perfect running order. Frequently some minor defect if not taken care of at once eventually will mean a big expense to the owner and, worst of all, dissatisfaction. That must be eliminated by readjustment which will send the car out ready for the acid test and calculated to put the owner in generous state of mind as regards his purchase.

Scrap Pile is a Problem

ıe

et

t-

16

n-

a-

ed

re

ad

re

n-

ed

he

en.

at

at

of

on-

nd

ce-

nas

not

me

ess

rith

ad-

no

us-

dis-

no-

ght

the

nte-

and

the

n of

con-

vice

n of

They

ssity

end

tone

e of

that

the

the 24 a

The scrap pile is another problem that is dwelt on at length by Simons. In a majority of service stations a defective part taken from a car is thrown in the junk pile and scrapped. Not so in the Simons garage. A salvage inspector goes over the scrap pile carefully and picks out such parts as it is possible to repair and put in the second-hand department. Small as it is in the individual case the aggregate of salvaged parts in a year reaches enormous proportions and means an immense saving in actual money.

Mr. Simons declares it is impossible to lay out much stress upon the value of the scrap pile as an aid to cutting down overhead expenses and increasing profits. He points out that some of the most important industries in the world now pay nearly all of their profits from what a few years ago would have gone to scrap heaps. He believes that the automobile service shop should also make the scrap heap pay no mean proportion of its annual profits.

Perhaps the most familiar example of the value of the scrap heap that comes to mind is in connection with the packing industry. Were the great packing houses obliged to rely upon the profits they make from their sales of meats, they would soon go into bankruptcy.

Figures adduced by packing houses show that dressed meats are actually sold for less than the same meat costs on the hoof. In other words, if a packer got from the sale of a slaughtered cow only what he realized from the sale of steaks, etc., he would not get back the money he tually paid for the animal when it came to the yards.

There is no reason why the automobile business cannot be

Some DON'TS Which Will Save Money

DON'T fail to turn off your light as soon as a job is finished.

DON'T use a full sheet of sandpaper when a half sheet will do.

DON'T fail to shut off the water when a job is finished.

DON'T use a pound of rags if a half pound will suffice.

DON'T throw away a defective part. Send it to the salvage pile.

DON'T scatter dirty rags or paper about the shop.

DON'T loiter about after you have finished one job. Report to the foreman immediately for another one.

DON'T let conversation with other employees distract you from your work.

DON'T forget that courtesy to a customer makes your shop a friend.

DON'T forget that your employer's reputation is staked on your willingness to turn out good work.

DON'T forget that a clean shop makes a pleased customer.

DON'T antagonize a customer, even if he is cranky.

DON'T forget that a hot head never makes warm friends.

conducted along the same lines or that even the smallest service station cannot get profits from its scrap heap. Hundreds of thousand of dollars worth of slightly worn or defective parts or materials used in automobile construction have, in the past, been allowed to go absolutely to waste. Were a systematic attempt made to save these, they would pay a handsome profit instead of representing an actual loss.

An example of this comes to mind in a large business in Chicago built entirely upon this scrap pile business. The founder of this business was originally a typical "rags-old-iron" man but he soon learned of the big profits being thrown away in automobile junk piles, specialized in this sort of junk and is, to-day, one of the wealthiest men in the automobile industry in the Chicago territory.

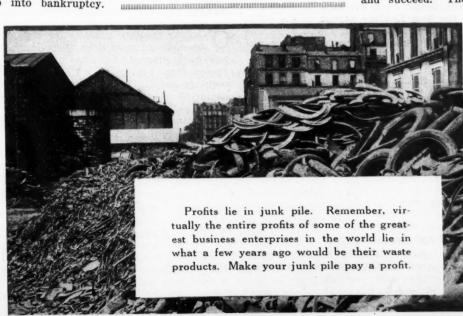
Possible Even in Small Plants

It may seem that an extensive salvaging of so-called scrap would prove too expensive a business for the small service plant; that the cost of salvaging would eat up all the profits realized from such work. This is not the case, however. Even the smallest station can keep its scrap heap and even if it does not do the actual salvaging itself, it should realize enough from the sale of these materials to larger salvaging business to make a considerable profit.

Sales of scrap material in small quantities are likely to be of a too hitor-miss character,—not worth the time of a man really competent in salesmanship. All of use have had the experience when we were youngsters of selling to the rag-man, and all of us know that the operation required considerable time and bargaining. All this may be avoided, however, by keeping the scrap heap intact until it is of sufficient importance to justify the time of a real salesman in disposing of it.

Summed up four basic principles must exist if the service station is to survive and succeed. They are economy, effi-

ciency, courtesy and loyalty. Given these and a policy of strict adherence to each and the garageman will himself watching the cars string into his station in a regular parade while the man across the street, who has not put his thought and his efforts into his repair shop whittles a stick in front of his garage, his one or two shiftless mechanics lounging about eating away his capital.





EDITORIAL



Courtesy a Prime Requisite

COURTESY is necessary to the success of any business, whether servicing automobiles or selling neckwear. People single out those business institutions where they are met with smiling faces and a readiness to serve. No matter how well qualified a man may be in every branch of the dealer's business, unless he is a good "mixer," he is utterly hopeless as a service manager or service salesman.

THE very nature of the business makes it necessary for the service manager to come into personal contact with many different sorts of people. Some car owners are coming in with a grouch. Others have a bone to pick with the service manager, the dealer, or whoever else they can get an audience with. Then there are those who come in with a smile, though their troubles might be greater than those first mentioned. All of them must be taken care of and the manner in which this is done either is making or breaking the dealer's business, so far as the service end is concerned.

C UTTING yourself out a little to help some owner costs very little or nothing, but it has its far-reaching effects. The service manager is the go-between of dealer and customer and courtesy is the first thing that should be considered. Owners must be made to feel that they are coming into somebody's home and the service manager as head of the house must be the one to extend the greeting. Thoughtfulness generally links up with courtesy and where you find one you are pretty sure to find the other.

W HEN women drive in, for example, the thoughtful service manager will perhaps, help them out of the car, direct them to the rest room after the reason for the visit is explained, etc. In short, we expect the up-to-the-minute service manager to possess those qualities that any person must have who has frequent occasion to meet all sorts of people in trouble and who diplomatically can settle a matter, and send them away satisfied.

The Call for Intensive Agriculture

NFORMATION compiled in tabular form, commonly known as statistics, is one of the most silent forms of print, but when such statistics concern our very existence, our food supply, and our to-morrow's dinner, they speak sufficiently loud that all may hear, if an ear is given.

W ORD comes that the farming population of the country is dwindling most astonishingly rapid. Such a state as Iowa, for example, with several thousands moving out from the agricultural industry into the manufacturing industry is not an exception. Illinois, Wisconsin, Michigan, Nebraska, Minnesota, Kansas and other states are contributing to this swollen stream which is flowing into the manufacturing centers. No less than 5000 people have left each of the states mentioned above. In the New England section of the country, whole farming communities have been abandoned. The farms are vacant. Their otherwise productive soil is not to be tilled this year.

A ND the cause for it all is seen in the high wages paid the factory employee. His farmer brother, who toils from sunrise to sunset, looks on and contemplates with what satisfaction it would be to work eight hours and be through

with the tasks for that day. Also a salary of fifty dollars a week doesn't look so bad.

W HAT will check the flow of farm populace into industry? The answer is farm machinery. The acres of soil under cultivation must be made more productive. The farmer must be made more efficient. He should be allowed to work under a profit system, as all other manufacturers do. At present the farmer's accounting system is governed by what he can get for his product.

W ITH proper equipment he can say, "Here is a bushel of wheat. It cost me \$1.27 to raise it. You can buy it for \$1.75." With proper equipment he can cultivate the same number of acres with one-third less men.

ONLY by creating a desire for farm work, can the people be made to remain on the farm. And until this desire has been created, agricultural expansion will be limited. Power farm equipment will create the desire. The equipment is rapidly being developed. It but remains for the dealer to sell the equipment and then keep it going, wherein enters service, the one factor that spells the success of the whole thought.



of

oil

he

to

lo.

by

of

for

me

ple

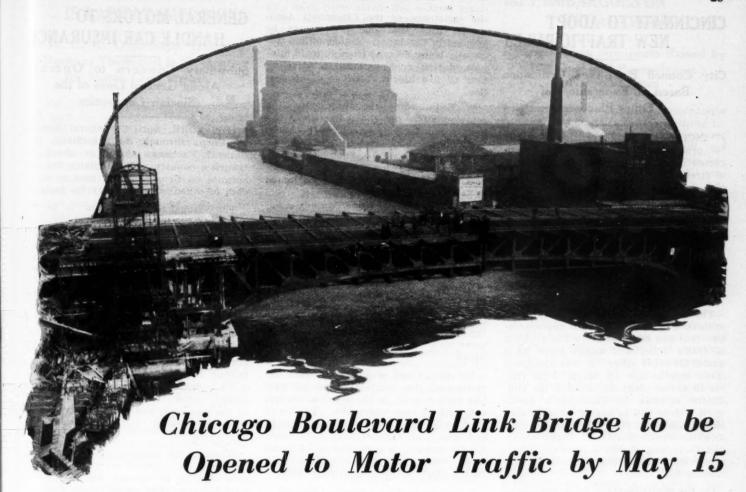
ire

ed.

the

ein

the



CHICAGO, April 5—The Rush street bridge, profanely known to Chicago motorists as the Crush street bridge, will pass to an unregretted grave within six weeks. Formal opening of the new Boulevard Link bridge to public traffic has been set by city officials for May 15, and high hopes are entertained that his date may be advanced a week or ten days. Final work on the big structure, which spans the Chicago river at Michigan avenue, and is the connecting link between the north and south side boulevard systems, is being rushed to completion.

Simple ceremonies marked the beginning of the end of the Rush street bridge and the opening of the Boulevard link. The leaves of the new bridge structure have been towering in the air for several weeks, attracting the attention of the curious who often voiced wonderment as to whether they would fit when lowered into position. All doubts on that score vanished one night last week, when the two leaves were lowered and found to "fit to a hair," as Michael J. Faherty, Commissioner of Public Works. under whose supervision the bridge has been built, expressively put it. After the midnight test, the bridge was again raised and the following day the bridge was "officially" lowered for the first time.

The Boulevard link bridge is unquestionably the most important improvement Chicago has yet made, as it affects motor car traffic. For years all motor traffic from the downtown district to the

By Lambert G. Sullivan

north side had to pass over the narrow bridge at Rush street, a relic of almost prehistoric days. That bridge was narrow, its approaches crooked and badly graded, both its approaches crossed by streets carrying heavy traffic and altogether the bridge was about as a bad a connection between two parts of a great city as could be well imagined.

Nearly twenty years ago it was conceded that a new bridge would be necessary for the growth of Chicago, but at that time the difficulties of construction seemed almost insuperable. The link, however, was embodied in the Chicago Plan and some five or six years ago it was determined to go ahead with the work, even if it did entail a tremendous expenditure of money, time and energy. Condemnation suits were started against property lying along Michigan boulevard in order to obtain a wide thoroughfare, preliminary plans were drawn up and the work started with a rush.

Many Handicaps Overcome

The last of the condemnation suits was settled late in 1918, and less than six weeks later the plans were committed, approved and actual construction started. Since then, despite handicaps of strikes, material shortages, war restrictions and kindred delays, work has been rushed along at top speed so that the project which a decade ago looked like one of the pretty dreams of the Chicago Beautiful plan will have

become an actuality before another two months have passed.

Heretofore, the trip from the north to the south sides of Chicago during rush hours has been a tedious one. By actual timing, it requires all the way from 20 to 45 minutes to make the trip over the Rush street bridge from Randolph to Erie streets, a distance of less than half a mile. The timorous driver who attempted to pilot a motor car through the congestion there during rush hours would never again tackle the task after one experience.

It is expected the new Boulevard link will eliminate all this delay and confusion. The link structure, including its approaches, is nearly half a mile long, stretching from Lake street on the south to Grand avenue on the north. The bridge itself is a little more than 250 feet long and is of the double bascule type.

It is of double deck construction, the upper deck being confined to motor car and other lighter traffic. Heavy trucking and teaming will be confined to the lower level of the bridge. The approaches are graded gradually and the streets leading to it are 127 feet wide at the south approach and 141 feet wide on the north.

The total cost of the new bridge structure, including the condemnation claims incurred, is in excess of \$15,000,000, but property values of pieces lying adjacent to the structure have increased more than 300 per cent.

CINCINNATI TO ADOPT NEW TRAFFIC RULES

City Council Prepares Ordinance Based on Experiences of Other Places

CINCINNATI, O., April 3—Absolute prohibition of parking in the congested districts of Cincinnati, rerouting of street cars in this area, establishment of a system of one-way streets, adoption of the pay-leave plan and multiple berthing of street cars, and regulation of taxicabs and heavy vehicular traffic, are included in the tentative draft of a model traffic ordinance that will be submitted to City Council soon by a special traffic committee that recently completed a study of traffic regulations in force in the larger cities of the country.

The committee which is drafting the ordinance is one of the most representative that has ever taken up the problem of traffic relief and might serve as a model for other cities. It was appointed three months ago by Mayor John Galvin to devise plans for meeting the conditions existing on Cincinnati's downtown streets and is basing its ordinance on data gathered from Pittsburgh, Philadelphia, Washington, New York, Boston and Cleveland, during a ten-day inspection trip to those cities, with a stenographer.

On the committee are three city councilmen, all chairmen of committees directly interested in the traffic problem; the Chief of Police, who must enforce the regulations; the Street Railways Director and the Superintendent of Transportation of the traction company, engineers from the Rapid Transit Commission and the City Engineer's office, and business men representing the Automobile Club, Chamber of Commerce and Business Men's Club.

While on the trip each representative gathered data in which he or his organization was particularly interested. Reports were made to the organizations on their return and in this way the full co-operation of the business organizations was obtained. After a preliminary report to the public by the full committee, explaining other cities' methods, a series of public hearings was held, a different phase of the problem being discussed at each hearing. After obtaining the views of all persons interested, the committee then began its draft of the new ordinance with the intention of making it meet fully the existing conditions and at the same time be acceptable to the business interests and the general public.

By handling the problem in this way, with the principal interests affected being represented fully in the making of the new regulations, Mayor Galvin feels that the regulations that will eventually be adopted will meet with the co-operation of all persons that might be affected, especially the automobilists. In fact, the ordinance is due largely to

the insistence of the Cincinnati Automobile Club that one-way streets be adopted in Cincinnati—automobilists frequently being delayed from 10 to 15 minutes, during rush periods, in traveling four or five blocks, because of congestion.

W. T. Calerdine, the Automobile Club representative on the committee, has been particularly insistent on the adoption of one-way streets and several months ago drew up a complete system of such streets for downtown Cincinnati and endeavored to have it adopted by Council at that time.

OREGON THEFTS MENACING

Portland, Ore., April 3—At last the Portland police department has begun to take the growing number of automobile thefts seriously. As pointed out recently by motor car dealers here, in the face of increased activity of thieves, twenty-six men on the police force were detailed to running down bootleggers and detecting a few moonshine stills, while just three men were on the automobile theft squad.

But now Chief of Police Jenkins has announced the creation of an automobile theft bureau, in charge of a lieutenant, with 18 men under him. Twelve of them will work the downtown section and inspect all garages daily. The other six are motorcycle men who will ride all roads leading into and out of the city on the hunt for cars reported stolen.

FEDERAL GAS PROBE IS ASKED

Washington, April 2.—Favorable report was ordered by the Judiciary Committee of the House of Representatives on the Dyer resolution, directing the Attorney General to make an immediate inquiry into the recent advances in the prices of gasoline, kerosene and other petroleum products. The Committee recommends a report to be made to Congress by June first.

Consideration of the sources of supply, profits of the oil business and whether any combination exists to restrain trade and regulate prices will be undertaken.

NEWARK SERVICE MEN TO MEET

Newark, N. J., April 3—Members of the Newark Automotive Service association will hold their next meeting April 12, when F. S. Dusenberg will talk on the construction of racing engines. The last meeting of the association was held last week and a number of new applications for membership were received. E. B. Benjamin, chief engineer of the International Oxygn Co., explained the different uses for gases and their application with the burning and welding torch.

OVERLAND PRICES RAISED

Detroit, April 2—Increases on Overland and Willys-Knight open models have been announced. Overland four, both touring and roadster, have been advanced \$40. Willys-Knight touring and roadster have been advanced \$275. Overland prices now are \$985 f. o. b. factory.

GENERAL MOTORS TO HANDLE CAR INSURANCE

Subsidiary Concern to Operate Along General Lines of the Sinclair Companies

NEW YORK, April 2—General Motors Corp., through its subsidiary, the General Exchange Corp., is about to launch a country wide campaign for insurance on General Motor cars or used cars of other makes sold by its dealers.

The Exchange corporation is to be an insurance company exclusively. It was incorporated in Delaware, April 10, 1919. Little has been heard of it up to this time, because officials have been arranging for its operation under the many differing requirements of the individual states. These requirements have already been met in many states, notably New York and Illinois, and agents are now busy soliciting insurance.

It was learned the company will operate along usual insurance lines, maintaining standard rates, but will feature quick service on adjustments. General Motors service is to be the watchword of the company, and delays now experienced by dealers and owners will be eliminated.

Whether the business of the corporation will be extended so as to include cars sold by all dealers will be determined later. The point most emphasized is that there will be no connection between the Exchange corporation and the Acceptance corporation other than that they are General Motors subsidiaries catering exclusively to General Motors dealers. W. A. Edgar is general manager of the exchange.

LIMA DEALERS ELECT OFFICERS

Lima, O., April 3—The organization of the Allen County Automobile Trade association, which has been in progress for some time was recently completed by the election of Joseph C. Hartline of the Hartline Motor Co., president; O. L. De-Weese of the DeWeese Garage, vice-president, and A. M. Heriett of the Heriett Tire Service Co., secretary-treasurer. A board of directors was named and steps were taken to affiliate with the Ohio Automobile Trade association. Membership is now more than 50 and it is planned to start a membership campaign to increase that number.

CAN'T STORE GASOLINE

Cincinnati, O., April 3—Cincinnati automobile owners are between two fires. Because of reports that gasoline would advance to 40 cents a gallon soon, they became alarmed and began to lay in extra supplies. The extent of this practice has caused Edward Steinway, of the Fire Prevention Bureau, to issue a warning that these supplies must be stored underground, for the building code limits storage above ground to twenty-five gallons. All violations will be vigorously prosecuted, he adds.

e

0.

d

e

Ī1

0,

to

ie

i-

ly

n-

re

al

rd

nj-

be

de

1'-

19-

on

nd

an

di-

ral

ral

of sofor the the Deesiiett A eps hio peris ign

ine oon. lay this

e a

be

to will

FREIGHT CAR SITUATION IS RAPIDLY IMPROVING

N. A. C. C. Committee, However, Declares There Still Is Shortage for Motor Car Purposes

NEW YORK, April 2—Reports received from the representatives of the traffic division of the N.A.C.C., who are making personal visits to all the railroad headquarters in the country, indicate a slight increase in the supply of cars for the automotive industry. The situation is still very serious, however, and constitutes the greatest present handicap to manufacturers. Orders for supplies are accepted more readily, but the difficulty is in getting them delivered.

Some manufacturers are using coal cars for the shipment of motor cars. They have designed special cranes for hoisting them into the gondolas, cover them with tarpaulins and send them away.

Somewhat better conditions are expected in April for March always is one of the worst months in the year, and it has been particularly difficult this year because the rate of production is very high and highways generally are in such bad condition they cannot be used as an adjunct to the railroads. This condition has placed added emphasis upon the importance of devising some means of keeping roads open for traffic the year round.

NEW LAFAYETTE DISTRIBUTORS

Indianapolis, April 3—Three new distributor connections have been announced by the LaFayette Motors Co., covering the territory served by Detroit, Buffalo and Dallas.

Charles W. Hathaway of Detroit, and Frederic Eaton of Buffalo, under the

firm name of the Lafayette Distributing Co., have been given the Detroit territory. Mr. Hathaway formerly was assistant sales manager of the Cadillac branch in Detroit, while Mr. Eaton has had distribution association for several years in Buffalo, Detroit, Cleveland and Cincinnati.

Charles B. Kane will handle the Lafayette in Buffalo, having recently discontinued the handling of Cadillac cars in that territory. His firm will be known as Lafayette Buffalo, Inc. The Lafayette-Gaston Co. has been given the franchise for Texas and Oklahoma. George H. Gaston, head of the new firm, formerly handled the Cadillac car in Oklahoma.

MILBURN NOW TRUCK DISTRIBUTOR

Cincinnati, April 3—Further evidence of the ascendancy of the motor truck in the field of transportation is seen in the announcement of the United States Motor Truck Co., that its product will be distributed in Ohio, Michigan and Illinois by the famous old Milburn Wagon Co. of Toledo.

The name of the Milburn wagon has been known throughout the country for 75 years and has been a household word with farmers for three generations. It always has been symbolic of quality and fair dealing. The fact that this company has gone into the truck distribution field shows that it believes the day of the horse drawn wagon is rapidly waning.

LIST DELINQUENT CUSTOMERS

St. Louis, April 2.—Information as to the credit standing of customers of the St. Louis Tire Dealers' Association is being compiled for the members of the association by Capt. Robert E. Lee, secretary. The purpose is to protect the dealers from being imposed upon by slow-pay customers. This is the greatest abuse they have to deal with.

LIFT EMBARGOES ON INDIANAPOLIS CARS

Restrictions on Shipments Raised by Big Four and Pennsylvania Railroad Lines

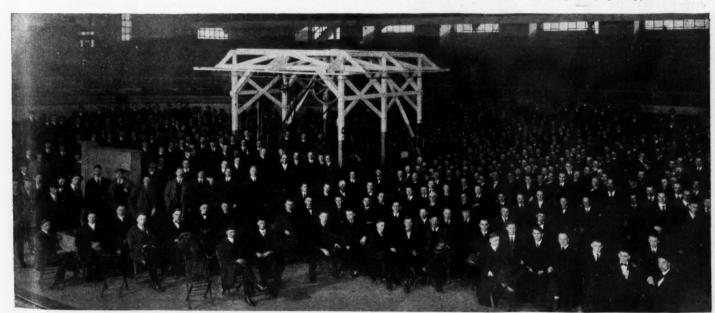
NDIANAPOLIS, April 3—Indianapolis motor car manufacturers are being relieved, according to the statement of railroad officials, by the lifting of embargoes on shipments to and from Indianapolis. It is predicted that all embargoes on freight will be lifted within the next two weeks.

This will relieve a situation which has tended to decrease the production and make deliveries difficult by Indianapolis motor car factories. For some time it has been impossible to get shipments out of Indianapolis because of the lack of automobile freight cars. This has developed drive-aways in all directions.

For several weeks, there has been an embargo on trap and ferry cars on the Big Four and Pennsylvania lines. Trap and ferry cars are used in hauling freight from factory warehouses to freighthouses. The Big Four has already lifted this embargo and the Pennsylvania is soon to follow. Restrictions on less than carload lots into the city have been lifted. There is yet considerable congestion on the eastern lines, not fully recovered from recent storms, which is having its effect on the Indianapolis shipping situation. Local motor car manufacturers report a delay in the receipt of shipments of materials coming to Indianapolis.

NEW FIRM MAKES RIM REMOVER

Chicago, April 3—The Simplex Rim Remover, formerly manufactured by the Simplex Steel Stamping & Mfg. Co., St. Louis, will hereafter be made by the Niswander Mfg. Co., Quincy, Ill.



G. T. O'Maley, Ford and Fordson veteran of Kansas City, recently held a "mechanical clinic" for Ford dealers. It drew an attendance of more than 1100 dealers, and an owners "clinic" the next day packed the big exposition building. Ford officials declared it the most successful ever held by one of their dealers

California Starts Investigation of Gasoline Price Raises

OS ANGELES, April 2-The action of the Standard Oil Co. in advancing the prices of fuel oil and gasoline, effective at once, will not go unchallenged in this state. The price of gasoline was advanced 2 cents per gallon and that of fuel oil 25 cents a barrel at the well. The State Railroad Commission has called the Standard to account and in Los Angeles county the district attorney has been instructed to undertake investigation and

TO STANDARDIZE STORAGE RATES

NewYork, April 3.-Standardization of storage rates in all garages south of Forty-second street, is the aim of the recently formed Garage Owners' Protective League of New York, Inc. Committees of the organization are now working in specified sections to enlist the membership of every garage owner in the territory designed to be covered.

A standard list of rates for storage space is now being prepared by a committee which upon completion will be submitted to the general membership for adoption. In preparing the list the outside measurements of cars and trucks will be considered rather than the weight. It is also planned to differentiate

in the rates on closed and open bodied passenger cars.

The rates will be so prepared as to encourage owners of small passenger cars to store them with the members of the association. rather than to drive them into storing their cars in smaller, cheapquarters. With commercial cars a uniform rate will strictly be enforced as the league feels that heavy commercial cars can only be stored in buildings designed for housing them. Questions of adopting standard gasoline rates were missed.

Officers of the new organization are: Morris Segall, president; J. J. O'Malley, vicepresident; Robert ert Friedman, treasurer; Joseph Toch, secretary, and S. H. Aarons, counsel.

learn if there has been any violation of the statutes.

One of the principal causes for the Railroad Commission to become aroused is attributable to the widereaching effect of the increase in the price of crude oil. California has had less than a normal rainfall this winter. Hydro electric energy is depended upon chiefly by the producers of electric current in this state. The sub-normal rainfall and lack of heavy snows in the watersheds means a water shortage that will continue throughout the year. Lack of water will necessitate electrical energy being generated through the medium of steam and crude oil will be used for this purpose. Coal is used comparatively little by the power companies. The necessity to use oil at an increased rate will mean an advance in the price of electric current and practically every user of electricity in the state therefore will be affected. The same situation applies to gas.

In addressing Pres. Kingsbury of the Standard Oil Co. of California, the Commission says: "The reasons given by you for this increase apparently are not based on financial needs of the company. You do not say the Standard Oil Co. of California is in need of additional revenue, but you give as your full reason for this increase that there is a scarcity of oil and that oil is selling in the east at higher rates than in California."

Mr. Kingsbury had complained oil and gasoline were being shipped from this state and resold in the east at higher profit than his company was earning at home. His allegations will be laid before the investigating board.

REDLANDS TO TAX TRUCK MEN

Los Angeles, April 3.-Needing increased revenues, the city of Redlands has decided to try and make them up in part from operators of motor trucks. It has been decided to charge a flat license fee of \$25 per truck for all vehicles owned in Redlands and all that are owned elsewhere but are used in making deliveries in Redlands. Another provision of the new ordinance stipulates that owners of trucks for hire must have inside headquarters for their business and trucks, no longer being permitted to stand their vehicles on the streets and solicit trade in that way.

"CHAIN STORES" POPULAR

Wilmington, Del., April 1. - The "chain store" idea has taken hold of the automotive industry, and, from what can be learned of the venture in mind, it is likely to succeed. This is the belief of Edward P. B. Carrier, the originator, who has his headquarters at 1411 Walnut

street, Philadel-

phia.

The inception, progress, possibilities and future of the accessory chain store idea were outlined at a banquet here a few nights ago in celebration, by the United Auto Stores, Inc., of the opening of the company's seventeenth store here. Five years ago, Mr. Carrier, who is president of the company, said he worked behind the counter in an accessory store, using part of each day in going out to sell tires. Seeing the success of the chain store idea in the grocery and other lines, he believed automobile accessories could be handled in the same way. He consulted a number of chain store men, including A. N. Kimmey, who has had eight years' experience in that field, and the result was the

Here's the Youngest Repairman

PICHER, Okla., April 3—A garage and service concern here has attracted at least a third more trade by the employing of a boy of less than 15 years old as a "repair man." He has yet to get hold



of a machine on which he can not almost at once tell the owner what the trouble is and how much it will cost to make repairs and within half an hour of the time it would take to put it in running order.

Picher is a town of garages, each one with its trouble wagon, so that each one must have some extra attraction in order to hold its old trade and obtain new. But this particular one seems to have the others beaten several points at present. Young Riggs learned all he knows, practically, from his father, himself an old auto repair man. Joey could drive a big machine when seven years of age. In addition, he is a good salesman, and has made many sales since his employment at the Picher garage.

> He is actually an expert, and it is hinted that some men and women have "put their car on the bum" on purpose, merely to see Joey at work. However that may be, they usually go out of their way in order to let Joey do the repairing. They even tell the old Ford joke about him: For a joke, a farmer who had a corrugated roof blown off his barn sent the broken and twisted mass to Joey, without explanation. The story has it that he immediately received word from Joey, saying: "Your car is the worst wreck I ever saw, but I'll have it ready for you, and good as new in a few days."

> Anyway, Joey is a drawing card for the garage. And whenever a man's car breaks down on the road, he usually 'phones to Joey and asks if he cannot come personally. Joey not only receives a good salary, but many odd dollars come his way in the shape of tips for well done "hurry-up" jobs.

ds

in

It

se

re

ng

on

n-

de

nd

to

nd

he

the

an

is

of

ho

aut lel-

on,

iliof

ry

dea

at

a

in

i to

the the

ren-

ere. ago,

who

the

he the useach out Sees of tore cery s, he

omo-

ories

way.

hain

clud-

mey,

eight

ience

s the

formation of the present company five months ago. With 17 stores now, the development is to go right on and it is expected to have 100 by the end of the year, with large warehouses in Philadelphia, Pittsburgh and Syracuse, from which the stores will be kept supplied.

Mr. Carrier pointed out the advantages of wholesale buying, making it possible for all of the stores to keep some of everything used in the trade; also the advantage of having each store manager financially interested in his particular store, which is one of the company's ideas. Associated with Mr. Carrier in the enterprise are Harry J. Stokes, first vicepresident; Clifton T. Stackhouse, second vice-president; David W. Paxson, secretary-treasurer; A. N. Kimmey, Howard Watkin, John P. Kolb, Louis M. Wagner, George F. Gregg, E. J. Howes, R. H. Peale and Richard W. Rothschild, direc-

TWO HERSCHELL-SPILLMAN EN-GINE MODELS

Buffalo, April 2.-Production of the Herschell-Spillman Motor Co. of North Tonawanda will in the future be confined to two models, it is announced, under a manufacturing program calling for a minimum of 60,000 engines for delivery prior to December 31, 1920. Quantity production of the new model, 31/4 by 5 in. six-cylinder is well under way.

Department of Agriculture to Compile Reliable Tractor Data

WASHINGTON, April 2.—Investigation of farm tractors to determine testing and rating, of horses to secure working rating, of farm machines and implements to measure the power requirements, and of farm operations generally to secure accurate data relative to farm power, will be undertaken by the United States Department of Agriculture jointly with State Colleges, agricultural and trade organizations in the near future. Congress has been asked for funds to carry on the investigations, and as soon as they are made available, work will be begun. This work is the result of suggestions made at a general conference on farm power problems participated in last fall at Chicago, by representatives of the United States Department of Agriculture, State Colleges and other associations.

The economic factors of farm power problems have been divided in farm power requirements to include field operations and hauling, animal power, mechanical power, relation of forms of farm power to man labor and influence on the farm organization and operation. Field operations include plowing, disking, seeding and harvesting. Hauling will include road and farm transport. Animal power will include the sizes of animal units, cost of maintenance, quality of work and total utilization, while mechanical power which will include tractors, will consist of investigations of the type of power unit, cost of maintenance, total utilization, displacement of animal power, effect of type and size of horses and mules maintained, adaptation of available machinery and the quality of work produced. Influence of the farm organization and operation will include studies of the sizes of farms and fields, topography of farms, soil, intensity of culture and farm profits.

Belt, draw-bar and fuel economy tests of farm tractors, education in the care and use of farm equipment, service to owners of machines, causes of suc-

The Year of the Big Wind



quarter of a mile from the path of the whirlwind and with true professional zeal, his one regret is that he wasn't close enough to determine whether his Bluebird, as he calls his racing car, wouldn't

run on compressed air

cesses and failures in farm machines, adaptability and the power requirements of all types of farm machines and implements will be studied.

The testing and rating of farm tractors will include field and laboratory tests to determine belt brake horsepower and draw-bar horsepower, as well as the fuel consumption of the tractor. These tests will be made under varied load conditions, probably at half and full load as rated by the manufacturer and also at maximum load that can be developed. The tractors will be operated at the speeds recommended by the manufacturers. There will be an endurance test for the purpose of showing any defects that may exist and to determine whether the rated load can be secured under conditions of continuous operation. It is proposed to issue a card show-

ing the ratings of tractors. The committee decided that each of the forms of farm power now found on the modern farm in this country has its place, and that the central problem is to ascertain the respective fields in which each form of power can be used, and the relative profit of the different forms in the fields in which they compete. It also declared that it is necessary to provide official ratings for tractors and that these should be Federal rather than State ratings.

The Department of Agriculture will start this work immediately after securing the necessary appropriations.

St. Louis Dealers to Try to Enforce New Tax on Gasoline

ST. LOUIS, April 2.—The St. Louis Automobile Manufacturers' and Dealers' association is interesting itself in seeing that dealers in gasoline at filling stations pay the tax levied by the city of one-half cent a gallon, the sum collected being used in the repairing of streets. The tax is being contested by all of the gasoline men except three—the Standard Oil Co., Pierce Oil Corp. and Automobile Gasoline Co. Pressure is being brought to bear by the association on other concerns to pay the tax.

A committee is being selected to confer with C. M. Talbert, director of streets regarding the expenditure of this money.

the present service station, upon which the erection of a modern service station to cost about \$150,000 will be started at once. An architect has been commissioned to draw the plans. When completed the new structure will be connected with the present building, giving a space about 150 by 235 feet. It will be arranged that one building can be reached from the other.

URGE MARYLAND RECIPROCITY

Washington, April 2.—A bill has been passed by the Maryland State Legislature and seems certain of approval by the governor, which would permit the issuance of one license under a double fee to motorists and good for use in either the District of Columbia or Maryland. The bill does not meet with the approval of the Government of the Dis-

trict of Columbia.

Maryland and the District are the only sections of this country where there is no reciprocity for motorists. An automobile owner in the District of Columbia must secure a license from the State of Maryland before he can drive over the state line regardless of the length of time he may desire to stay in Maryland. As a result of this action by Maryland, the District has taken similar action for years and Maryland motorists can not enter the District without a District license. District motorists have a plan of reciprocity such as granted between other states in

this country and consequently do not favor the new bill which does not reduce the fee but eliminates only the use of two license plates. Maryland collected \$400,000 last year from motorists residing in the District of Columbia who were obliged to take out Maryland licenses although it may be only for a single trip through the State to Philadelphia or New York.

DEALERS TO BUY WAREHOUSE

St. Louis, April 4.—A separate corporation is being organized by members of the St. Louis Automobile Manufacturers' and Dealers' Association to lease a large warehouse in East St. Louis for the storing of cars. The purpose is to combat what they term the high cost of storage in St. Louis, the charges being from \$7 to \$9 per month per car. No suitable building on this side of the Mis-

The Latest in Taxicabs



As usual, the French are introducing a novelty, this time using a motorcycle with side cars for use as taxicabs

LACK OF STAMPS LOSES CAR

St. Louis, April 2.—Have you any mortgages on motor cars on which the necessary revenue stamps are not affixed? You had better look, for if the stamps are missing you are liable to lose the car. That is exactly what did happen to Frank Moran, a money lender of Des Moines, who held a mortgage of \$1500 on a car seized by Federal agents in St. Louis under the Volstead Act.

Judge Faris ordered the car sold. Moran asked for an allowance to cover his mortgage. Under the Volstead Act mortgages are protected under seizures, but Judge Faris ruled this particular mortgage was inadmissible as evidence because it lacked revenue stamps required on such documents. The car will be sold and the proceeds will go into the treasury of the United States.

The stamps would have cost 30 cents.

and the Team and Truck Owners' association each will have a representative on the committee.

The Manufacturers' and Dealers' assosociation also is making a fight for the proposed bond issue of \$24,000,000 for St. Louis. P. H. Brockman, president of the Association, is chairman of the automobile trade committee, and R. E. Lee, secretary, in charge of the campaign. The trade will supply motor cars for use of speakers going from meeting to meeting and for parades.

TO ERECT FORD SERVICE PLANT

Columbus, Ohio, April 5—What is believed to be the largest Ford service station and sales agency in Ohio will soon be started by the Carroll-Thompson Co., Columbus, Ohio. The company has purchased a tract 150 ft, sq. adjoining

ch on

at

is-

m-

n-

ng

ill

en

la-

by

the

ble

in

TV-

the

is-

bia.

n, d

are

ons

try

no

mo-

uto-

in

Co-

SP-

1 s e

e of

fore

over

the

he

stay

As a

ac-

and.

has

ac-

and

otor-

enter

with-

rict

strict

ave

ecip-

as

ween

s in

not

educe

se of

ected

resid-

who

yland

for a

Phila-

SE

e cor-

mbers

nufac-

lease

uis for

e is to

cost of

being

r. No

ne Mis-

sissippi is available. The East St. Louis warehouse is available to the railroad tracks, and most of the cars shipped to St. Louis are from the East. The plan is to base the storage charges on the actual cost of rent and operation.

The matter was discussed at last Thursday evening's meeting of the association. Here also it was decided to take a poll of the members to ascertain the number of used cars, and their makes, in hands of dealers. The object of the census was to learn whether the number of used cars on hand were normal.

Resolutions were adopted urging railroads to have wide-door cars adapted to carrying motor cars built in their new equipment.

TO GIVE LESSONS FOR DRIVERS

Minneapolis, April 4-A school for automobilists is to be conducted here with ten lessons, in charge of traffic specialists. At the first meeting in the Minneapolis city hall March 23 under direction of R. C. Haven, in charge of the Minneapolis division of the National Safety council, 200 truck drivers were present when Mayor J. E. Meyers favored a state law requiring state examination for all motor car drivers as requisite to drive a car. Superintendent of

hiles operate on the streets of Minneapolis therefore co - operation of truck drivers is asked to eliminate accidents and congestion. E. C. Hillweg of the Civic & Commerce Association said 89 of 90 traffic accidents since Jan. 1 had resulted from traffic law violations.

Ten lessons are to be given in St. Paul resulting from a meeting attended by more than 200 drivers and traffic officers.

Mayor L. C. Hodgson and other city officials spoke. This is under the auspices of the new St. Paul division of the National Safety council The meetings are Tuesdays.

JACQUET IN PRODUCTION BY APRIL

Belding, Mich., April 4-Jacquet Motors Corp., organized recently, expects to be in production about the middle of April. The company has purchased an ammunition factory and property adjoining, for which it paid \$50,000 in cash. Machinery for automobiles rapidly is being installed, and the company is assembling and organizing its working force.

LEACH-BILTWELL PRICE IS \$4900

The price of the Leach Power Plus six-cylinder car built by the Leach-Biltwell Motor Co. of Los Angeles, Cal., is \$4900. This price, through a typographical error, was given otherwise in the Feb. 5 issue of Motor Age.

Texas Dealers Hold Enthusiastic Annual Meeting at Dallas

DALLAS, Tex., April 2—Fully 500 retail automobile dealers and scores of automobile men, manufacturers, writers and financiers attended the fourth annual convention of the Texas Automobile Dealers association here last week. Good roads, motorizing the farms, the future of the retail automobile business and financing an automobile business were the principal subjects dis-cussed. One of the features of the three days' convention was the development of the spirit of co-operation among the automobile men, a feeling which may result in one dealer assisting another, even in other sections of the state in filling dealers complained orders. The throughout the convention at being unable to get shipments promptly, but this was attributed to the gradual return of

were of the opinion that the extreme penalty in Texas should be meeted out to thieves and that there should be no suspended sentences for such criminals. The association also "raked" alleged "second hand dealers" who are not particular about where they get a car so long as it is at a bargain. They thought a good plan would be for second hand dealers to demand a "pedigree" rather an extended bill of sale with every second hand car, a bill of sale showing all previous owners to whom sold and under what conditions. They were of the opinion that this would make it hard for thieves to dispose of cars.

SERVICE IS NOW AIR NEED

Buffalo, April 2.—Service is now the big thing to be considered in development of the airplane, according to Lieut. A. Claire Sager, formerly of the United States Aviation service, who recently addressed a veterans' association here.

"The airplane has passed the experimental stages," Lieut. Sager said.

"It is no longer a thing of mystery, and its passengers no longer regard a flight as a death defying adventure. What is needed now is service. Buffalo, every city that seeks leadership in commercial airplane activity, must have its

municipal landing field. Service such as gas, oil, repairmen and parts must be easily accessible if fullest utilization of the airplane is to come now instead of at some far distant time in the future.

"Many communities are gradually awakening to the need of proper facilities and when service is once established the rest will be easy." The lieu-tenant has been associated with the

flying business for six years, being one of its pioneers in this country.



"Pooh! Pooh!" remarked W. H. Burtis, Superintendent of the Mechanical Department of the Oregon State Highway Commission, when he saw some pictures in a recent issue of Motor Age of how they loaded motor trucks on trains in Chicago. Then he sat down and sent us this picture of how much better they do it in Oregon

war industries to peace time industries and the crowded conditions of the railroad yards in the shipping centers. Dealers and manufacturers believe these conditions will be remedied shortly and the retail business in Texas and all over the country returned to normal.

Good roads came in for a considerable part of the discussion. The dealers are alive to the fact that good roads mean more automobile business and they went on record as favoring the construction of good roads in all sections of the state. It developed at the convention that the retail dealers of Texas have been solidly behind every bond issue for the construction of permanent roads for the past years and that they are going to continue behind the proj-

Automobile thefts and how best to curb the growing business in that line brought quite a lot of talk. The dealers

GOODYEAR FACTORY MEN TO COAST

Akron, O., April 3-Goodyear Tire & Rubber Co. will take a "Flying Squadron" of about 100 employees from its Akron plant to the new California plant at Los Angeles, in a few days. The men selected are factory experts, and they will be in the charge of C. R. Langdon. C. C. Slusser, manager of the personnel department, will go to California as factory manager, and Herman Barron will become division superintendent at the California plant. The near departure of the "Flying Squadron" has had the effect of hurrying up many weddings among employees, who will establish their homes on the coast, and the special train which will take them to California will take the nature of a honeymoon express for the newlyweds.

Added Prizes Make Hoosier Race Purse Worth \$80,000

NDIANAPOLIS, April 2—An additional purse aggregating \$20,000 is being gathered by Indianapolis business men and manufacturers to be divided among leaders during the next international 500-mile race on the Indianapolis speedway, on the basis of \$100 for each lap that any contestant heads the field.

The father of the plan is George M. Dickson, president of the National Motor Car & Vehicle Corp., whose blue fliers were supreme on road and speedway until the firm retired from racing, following the victory of old No. 8 in the Indianapolis race of 1912.

Dickson's idea was that with \$100 a lap as an inducement to stay in the lead, every contestant would do his utmost to get out in front and stick, knowing that one hundred additional iron men would accrue to his personal fortune every

NO RACERS FOR FIAT

Turin, Italy, March 20—The report which has been widely circulated in the Press, that the Fiat Co. intended to build special freak racing cars in order to lower the world's flying kilometer record, is entirely without foundation. The Fiat Co. has no short-distance racing cars under construction, and has no immediate intention of building any. Last year the Fiat Co. entered into an agreement with a number of the leading continental motor car manufacturers not to take part in any European speed contests during the year 1920, and this agreement naturally will be adhered to.

This incorrect report appears to have arisen from the fact that last year Fiat sent a pre-war racing car to Fanoe Island, and that since then motor car engineers connected with other firms have inspected the beach at Fanoe Island with a view to ascertaining its suitability for a record run. Whilst it is not unlikely that short distance records will be attempted on Fanoe Island beach during the present year, no such attempt will be made by the Fiat Co. nor by any person in any way connected with the company. For the present the Fiat Co. has no intention of attempting to lower its own record of 142.9 miles an hour established by Duray in 1913 on a 300 hp. car belonging to a private owner.

RESPOND SLOWLY FOR TRUCK TOUR

Philadelphia, April 5 — Responses to the invitations to members of the Motor Truck association of Philadelphia, to participate in the proposed "ship-by-truck" farm tour the third week in May, it was announced at the monthly meeting of the association, are coming in somewhat slowly. Unless at least 18 or 20 trucks are listed, the tour, it is considered, would hardly be feasible.

time he passed the judges' stand in the van of the procession.

The result, of course, would be to speed up the race considerably, as well as to make for closer competition, since every contestant within striking distance of the lead would not be content simply to hold his position, but would constantly force his mount to the limit to grab off some of the extra money.

Indianapolis business men immediately seized upon Dickson's idea as an opportunity for the city to get behind the race, and to make it even a greater even than it now is, with the result that the proposed fund is well on the way toward completion.

With the additional lap prize of \$20,-000, and the usual accessory prizes totaling around \$10,000, the speedway's prize money promises to aggregate around \$80,000 this year, the greatest fortune that has ever been distributed for an automobile racing event, either in the United States or in Europe.

ORGANIZE CAMPING BODY

Detroit, April 2—Great Lake Way club has been organized in Grand Rapids with representatives from Cadillac, Holland, Petoskey and other cities in the Michigan tourist belt, for the purpose of conducting tourists camps this summer. The company will be incorporated under the laws of Delaware with \$500,000 of preferred stock at the par value of \$25, and 20,000 shares of common stock of no par.

The company proposes to establish five camps at the start, of a construction and character in harmony with their

surroundings, providing sleeping and eating accommodations for tourists. At the organization meeting the opinion was expressed that this will be the greatest touring year in Michigan history, the improved road condition and the many sight-seeing trips furnishing an attraction for automobile lovers.

GLIDDEN PROSPECTS BRIGHTEN

New York, April 2—Prospects for a renewal of the Glidden tours are brightening, it was said today at the A.A.A. Entries already have been received for Owen Magnetic, Lexington, Holmes, Saxon and Templar cars. It is hoped Marmon and Packard entries will be received and if they are it was said to be virtually certain there will be a 1920 tour.

The lack of entries is not by any means due to lack of interest, but rather to the fact that production is running at top notch in all factories and manufacturers feel they can ill afford to give the time that would be necessary to promote a successful run.

\$13,000,000 FOR NOVA SCOTIA ROADS

Halifax, N. S., March 26-That \$13,-000,000 would be expended upon the roads of Nova Scotia during the next five years. in an ambitious programme that would give the province the best average of roadways on the North American continent, was the announcement made by Hon. H. H. Wickwire, minister of highways, who laid the report of the commissioner of highways upon the table in the House of Assembly to-day. He says the programme which had been adopted by the Nova Scotia government covered a period of five years. This was because the federal government aid was granted for five years and it had been felt advisable to co-relate the two. This year the proposal was to extend \$2,605,000 on the roads of Nova Scotia.

Portland "Ad Men" Want a Motor Caravan to Meeting

PORTLAND, ORE., April 3—The Portland Ad club has stirred up national interest in its plan for a motor caravan run over the Pacific highway from Portland to Stockton, Cal., where the Pacific Coast Advertising Clubs' association will hold a convention May 25. The war department has just announced that a division from the Motor Transport Corps will enter the caravan which makes the run one of considerable importance from a military point of view.

In addition to this, George Bellis, manager of the new Northwest branch of the Goodyear Tire & Rubber Co., just established in Portland, has announced that his company will enter one of its famous Akron to Boston trucks in the caravan with the first load of rubber to be delivered to the new Goodyear factory at Los Angeles. A cargo of rubber for the Goodyear company is due in

Portland from Sumatra in May, but if it doesn't arrive in time for the caravan, enough for this first truck load will be taken from an Akron-bound shipment due in Seattle a little earlier.

In connection with this announcement, Mr. Bellis made another statement of much interest, not only to the Northwest, but to the whole Pacific coast. This was that the Goodyear company plans to establish in the very near future three long-distance fast truck runs on the coast, modeled after the Akron to Boston service. Pneumatic-tired trucks, of course, will be used.

One of these projected runs will be over the Pacific highway from Los Angeles to Portland and Seattle. When established this will be the longest truck run ever attempted on a regular routing. Another will be across the Cascade mountains via the Sunset highway to

1920

and

At

nion

eat-

the

any

rac-

N

or a

ght-

A. A.

for

mes,

ped

re-

n he

1920

anv

ther

ning

anu-

give

pro-

ADS

\$13,-

oads

ears,

e of

onti-

high-

mis-

n the

s the

d by

ed a

ause

inted

dvis-

r the

a the

ng

if it

avan.

ll be

ment

ince-

tate-

the

acific

com-

near

ruck

the

atic-

11 be

An-

When

truck

iting.

scade

y to

Spokane. And the third will be from Spokane to Lewiston, Idaho.

The project is still in tentative form, but Mr. Bellis says will almost certainly be put into effect on a regular schedule. Only company freight will be hauled, but the big purpose of the proposed service is to demonstrate just to what extent the modern motor truck with pneumatic tire equipment can hope to compete with railroads on long distance hauls.

ASK FOR ROAD PLANK IN PLAT-FORM

Washington, April 3—Both of the dominant political parties in the United States will be asked by the Federal Highway Council to put themselves on record at their national conventions on the subject of the national policy and plan for further highway development.

The Federal Highway Council, which represents hundreds of farmers and organizations interested in highway construction, is in favor of Congressional appropriations to assist the States in building their main roads and properly establishing efficient State Highway Departments. It favors the appointment of a Federal Highway Commission to have control of the national system of highways, and to coordinate the State work. It believes that the government should take over about 60,000 miles of the main highways to construct and rebuild where necessary as a national system, the States to take over 240,000 miles as the main State system, and the counties to take over 300,000 miles of market county roads, to make a system of about 600,000 miles, of which 250,000 miles have been improved, leaving 350,000 miles to be improved. The Council urges the continuation of Federal aid to the States after 1921 by continued appropriations.

General Car Price Advance Is Seen by Automobile Men

NEW YORK, April 3—That those automobile makers who have not already raised their prices will be obliged to do so in the near future seems to be a foregone conclusion, according to Dow, Jones & Co. Following tabulations covering a number of cars whose prices have gone up since January 1, show factory prices in January, 1919, January, 1920, present prices, advances since January, 1920, and advances since January, 1919:

Not only are some of the raw materials which enter into the manufacture

on a basis of what they formerly used. Other steel companies not working on such a basis are receiving from motor car producers premiums ranging from \$40 to \$80 a ton for various grades of finished steel.

The recent general advance of approximately 20 per cent in automobile tire prices is another item which means much to the motor car maker. The increased cost of a set of four tires ranges from about \$10 a car in the case of those using $30 \times x3\frac{1}{2}$ in. shoes to \$30 and \$40 a car for the larger sizes.

Price	Price	Present	Adv.	Since
Jan.'19	Jan.'20			Jan.'19
\$1,685	\$1,685	\$1,795	\$110	\$110
735	735	795	60	60
1,595	1,695	1,795	100	200
925	985	1,035	50	110
	1,595	1,675	80	280
525	525	575	50	50
	2,375	2,635	260	435
2,650	2,775	2,975	200	325
	4,800	5,100	300	900
3,950	4,650	5,000	350	1,050
895	985	1,055	70	160
1,490	1,490	1,595	105	105
1,075	1,075	1,165	90	90
1,295	1,390	1,450	55	155
. 2,760	2,900	3,250	350	490
3,740	3,740	3,940	200	200
	\$1,685 735 1,595 925 1,395 525 2,200 2,650 4,200 3,950 895 1,490 1,075 1,295 2,760	Jan.'19 Jan.'20 \$1,685 1,685 735 735 1,595 1,695 925 985 1,395 1,595 525 525 2,200 2,375 2,650 2,775 4,200 4,800 3,950 4,650 895 985 1,490 1,490 1,075 1,075 1,295 1,390 2,760 2,900	Jan.'19 Jan.'20 Price Jan.'20 \$1,685 \$1,685 \$1,795 735 735 795 1,595 1,695 1,795 925 985 1,035 1,395 1,595 1,675 525 525 575 2,200 2,375 2,635 2,650 2,775 2,975 4,200 4,800 5,100 3,950 4,650 5,000 895 985 1,055 1,490 1,490 1,595 1,075 1,165 1,295 1,295 1,390 1,450 2,760 2,900 3,250	Jan.'19 Jan.'20 Price Jan.'20 \$1,685 \$1,685 \$1,795 \$110 735 735 795 60 1,595 1,695 1,795 100 925 985 1,035 50 1,395 1,595 1,675 80 525 525 575 50 2,200 2,375 2,635 260 2,650 2,775 2,975 200 4,200 4,800 5,100 300 3,950 4,650 5,000 350 895 985 1,055 70 1,490 1,490 1,595 105 1,075 1,075 1,165 90 1,295 1,390 1,450 55 2,760 2,900 3,250 350

of motor cars extremely difficult to procure, but their cost is steadily increasing. Some of the smaller independent steel companies could dispose of their entire output to automobile manufacturers, but they are maintaining a policy of making allotments to regular customers

TO PAVE NORTH IOWA PIKE

Charles City, Iowa., April 2-The North Iowa Pike is to be paved for fifty miles in Iowa before November. Counties situated along this highway continue to lead all others in the state in the matter of permanent road improvements and will no doubt be the first to complete their paving. The fifty miles of the North Iowa Pike to be paved are located in Floyd, Cerro Gordo and O'Brien counties. Twelve miles of the highway is already paved from Mason City to Clear Lake. Contracts have been let for eighty miles of the primary road systems paving of the state. Twelve miles has been let on the Jefferson highway in Cerro Gordo county and connected with the North Iowa Pike. Work will start in April on most of the contracts. All of the paving is to be reinforced concrete construction. A new gravel pit has been opened in O'Brien county and tests of the material are now being made.

French Now to Adopt the National Highway Idea

PARIS, March 19—Recognizing that the road problem cannot be properly handled by the present government departments, the French Ministry of Public Works is endeavoring to reach an agreement with the Treasury Department for the formation of a special National Roads office. This body, while being attached to the Ministry of Public Works, would have complete autonomy on all matters dealing with roads. administrative council would consist of engineers from the government roads department, and delegates from the Touring club, the Automobile club and the various automobile manufacturers' associations.

One of the greatest innovations is that taxes levied on road users would be specially ear-marked for road maintenance. This has never previously been admitted by the French government. Further, all road vehicles, whether mechanical or horse-drawn, would be

taxed. The amount raised in this way will be \$34,000,000. Before the war the upkeep of French roads cost \$8,000,000 per annum. It is expected that the cost now will be \$20,000,000, thus leaving \$14,000,000 for special work and the maintenance of new roads.

TAKE OVER INDIANA ROADS

Indianapolis, Ind., April 3—The state highway commission today took over by law the 3,200 miles of highways in Indiana which it must supervise during the process of building a new state highway system.

The state highway commission has appointed twenty-four subdivision superintendents who are to have charge of territories under the supervision of five district engineers. A force of 500 men probably will be in the employ of the maintenance department. The divisional headquarters are Vincennes, Seymour, Greenfield, Ft. Wayne, Monticello.

HOOSIER FIRM INVADES DETROIT

Indianapolis, Ind., April 3—The Buck Co. of Indianapolis, with a branch in Cleveland, is opening a branch in Detroit for the sale of motor trucks. In Indianapolis the Buck Co. are distributors for the Studebaker car and the Autocar and Diamond T trucks, selling these trucks in Cleveland. The autocar alone will be sold in Detroit.

Chicago Dealers Prepare for Their Used Car Show

Association Will Make Thorough Tests of Machines Exhibited for Display

CHICAGO, April 3—Chicago dealers will stage their third annual Used Car Show this year from April 28 to May 5. The Coliseum and Coliseum Annex have, as usual, been selected for the exhibit and applications for spaces already received indicate that all room in the two buildings will soon be taken. As a premium on early applications, the fifty choicest selections in the Coliseum are reserved for the first fifty applicants and late comers, regardless of the amount of space they may choose to rent, are obliged to take less desirable positions.

Stringent rules have been issued to

govern the show. All used cars to be exhibited must be submitted to a rigid inspection by technical committee appointed by the management of the Chi-Automobile cago Trade association, committee this consisting of service managers of some of the leading firms. The inspection to which this committee subjects all cars is extremely rigid and. therefore. ears which finally are displayed in the Used Car Show can safely be counted as in first-class condition.

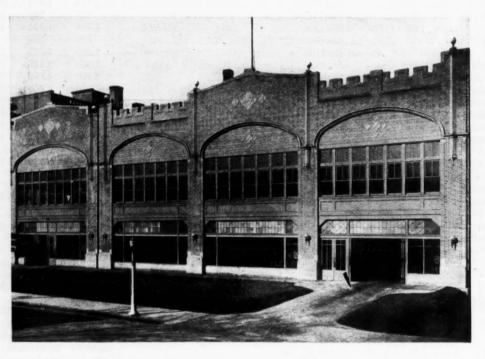
In addition to the mechanical inspection, however, provisions are also taken to make the show a "one price"

affair. Before exhibiting, dealers are obliged to name the price at which the car to be shown is to be sold and also to list just what is to be included in its equipment and extra equipment. This price is plainly printed on the mechanical inspection card and must be adhered to by the exhibitor. Changes in price may be made only at the close of the daily sessions of the show and then only with the permission of the show management.

The previous shows of the Chicago Automobile Trade association have done much to establish the used car industry on an extremely big plane in Chicago so that buyers of cars in this district feel just as confident in buying used cars from any member of the C. A. T. A. as

they would in buying a new car. This feeling of confidence, which was largely the result of the Used Car Shows of the past, has undoubtedly redounded to the benefit of the entire used car trade in the city.

The show is sponsored by the Chicago Automobile Trade association and as such, is not a money making proposition. Space in the building is rented to members of the association at the rate of 75 cents per sq. ft. with a minimum of 100 sq. ft. to an exhibitor. Complimentary tickets are distributed to all exhibitors, a minimum of 1,000 free tickets to each exhibitor, and this number can be increased at the discretion of the show management. The amount received from the rental of show space serves to defray all expenses connected with holding the show and whatever money is received from paid admissions at the door is held and returned to exhibitors pro rata with the amount they were assessed for ex-



The Macon show this year is to be held in the recently completed sales and service station of the H. J. Lamar Co., Oldsmobile distributor for the district

hibition rental. The show is scheduled to open the evening of April 28 and will continue morning, afternoon and evening every day thereafter until May 5. There will be numerous entertainment features besides the regular car displays.

ST. PAUL TIRE MEN ORGANIZE

St. Paul, March 28—The St. Paul Tire Dealers' Association has been organized with forty-two dealers present. High grade business practices are to be fostered by the association. Officers are: President, Arthur W. Randall, Northwest Tire Co.; vice-president, Frank C. Bass, Schoonover & Bass; treasurer, Charles Lacore, White Automobile Supply Co.; secretary, Milton Rosen, M. Rosen & Co.

Macon Makes Great Preparations for Show

Georgia City Aims to Make Exhibit the Leading Feature of South This Year

M ACON, Ga., April 3—Macon promises to take the lead again with the first automotive show in the South. It was here that the first national tractor demonstration in the South was staged, where the first motor truck demonstration in the South was held, and where the first aeronautical congress in the United States was held. Each one of the events "panned out" and there is every indication that the coming Automotive Show, to be held May 5, 6, 7 and 8 will be equally as successful.

An exposition building built of concrete and steel, with 250,000 sq. ft, of

floor space has been obtained for the show. There will be separate sections for automobiles, for motor trucks, for farm tractors and for automotive accessories, and as a background there will be a Japanese setting, with beautiful decorations in ' green, white and pink, elaborate and costly.

The second night of the show will be Society night, at which debutantes will act as sponsors for the different exhibitors. The entertainment committee promises a continuous program of entertainment, with band concerts every afternoon and evening. Macon has 800,-

000 persons within a radius of 60 miles of this city. This city was first in the state to float a bond issue for paved highways and all roads radiating from the city are either paved or are in course of paving, so there is plenty of interest in automobiles and farm trucks especially, and since the national tractor demonstration no less than 2000 farm tractors are in use in this territory.

ISSUES MOTOR LAW BOOKLET

St. Paul, April 2—Julius A. Schmahl, secretary of state for Minnesota, has issued for the convenience of motorists, a fourteen-page folder, giving in brief the principal laws governing motor vehicles as well as additional valuable information.

S

d

of

28

or

re

te

0-

or

m

or

S-

a

re

n-

th

a-

en.

nk,

st-

ht

be

tes

oner-

The

n-

ttee

on-

am

ent,

on-

tering.

iles

the

ved

rom

ırse

rest

spe-

ctor

arm

nahl,

s is-

rists,

brief

· ve-

able

r

Oklahoma City Show **Draws Good Attendance**

Special Body Jobs Are a Feature of Display Which Draws From Oil Golconda

OKLAHOMA CITY, April 2-The Fourth Annual Automobile Show, held under the auspices of the Oklahoma City Motor Car Dealers' association opened March 22 and drew a large attendance in spite of unusually inclement weather. The new Coliseum was formally turned over to the show committee by the group of enterprising citizens and business men of Oklahoma City who, in a remarkably short time, have promoted and built it.

This spacious building has been decorated until it is a veritable bower of leaves and blossoms and compares favorably in general appearance with automobile shows your correspondent

has viewed in cities of more than 1,000,000 population. Dealers handling both passenger cars and trucks are displaying both and all such dealers report a very strong opinion in favor of such a show rather than a separate exhibition for cars and one for trucks. Accessories and garage equipment are also included in the big show, although in an exclusive nook of their own on one side and at an elevation of about six feet overlooking the vehicle exhibits.

One of the notable features of

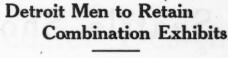
this Oklahoma City Show is the prevalence of special body jobs both on passenger car and truck chassis. These special jobs in passenger cars are as beautiful and costly as any shown at northern and eastern shows and retail as high as \$10,000, and many of them are already sold, although the show is only half over.

As usual people attended this show from all parts of Oklahoma and several other southwestern states, but the feature of this year's attendance is the large number of dealers that have poured into the big show since the doors were first opened. This proves that Oklahoma City is the real distributing market for motor vehicles and accessories and that the dealers are glad to make an annual pilgrimage here to see the latest styles and models.

Like previous Oklahoma City shows there is an abundance of entertainment this year. One of the best jazz bands in the country provides music during the day and evening and five women soloists and dancers have especially gained the attention of visitors. Just outside the Coliseum, in a large tent, a real dance hall has proven a real diversion during the evening, both for visitors and those connected with the various exhibits.

USED CAR SHOW FOR COAST

Los Angeles, April 5-The Used Car Dealers' association has announced its first annual show to be held some time during April. This organization is independent of the Motor Car Dealers' association as it represents used car dealers exclusively. This will be the first used car show of any magnitude to be held in this city. There have been events before but they were not representative of an organization. It is a certainty the cars that will be on display will have little semblance of the "used" car as every one



Vote Against Separating Truck and Passenger Car Displays in the Future

DETROIT, April 4.—The truck division of the Detroit Automobile Dealers' Association held a meeting Tuesday night at which it was decided unanimously to continue the display of trucks and commercial cars with automobiles at the annual show. The idea of holding a truck show independently was discussed from every angle, but none of the dealers favored the idea.

All of them were enthusiastic over the sales results of the recent show, and cited experiences at New York and Chicago, where truck shows were held separately at a loss in support of their contention for a combination exhibition.

J. C. Ayers, president of the Towar-

Ayers Truck Co., Denby distributors, presided at the meeting at which sixteen dealers were in attendance. W. F. V. Neumann, who declared his firm sold eleven trucks at the Detroit show. made a short talk in which he urged the advisability of continuing under the present system, and was supported strongly by Frank M. Foster; Cliff Starkweather, of Owen; Graham & Starkweather; H. A. Bauer, of the Nash Distributing Co.; J. H. Thompson, of the Thompson Auto Co.; Frank Gmelin and H. A. Conlon, of the Acason

Truck Sales & Service Co. Manager H. H. Shuart called the roll of members for an expression as to their views in lieu of a vote, and practically all of them expressed themselves as so highly gratified with the results obtained from this years show as to proclude the possibility of separating the two exhibitions.



Oklahoma City held its show this year under the most auspicious circumstances imaginable-in a district in which everyone seems to have all the money he wants and his principal want seems to consist of getting a motor car of some sort, price, style, etc., being secondary considerations to immediate delivery

of them will have been rebuilt mechanically, repainted and in many instances

It is hoped the show will materially help the used car business in California.

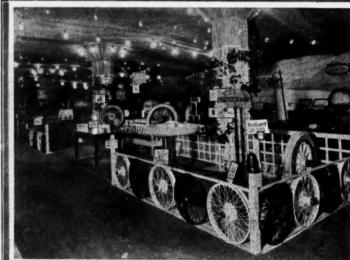
LICENSES FOR USED CAR DEALERS

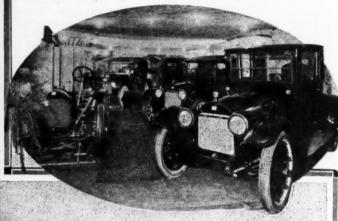
Des Moines, Iowa, April 2-Iowa dealers in used motor cars have the same privilege of taking out distinctive dealers' numbers as the dealers in new cars, according to a ruling by Judge Lester Thompson of the Polk county district court. Judge Thompson's ruling was a test case brought by the Cunningham Auto Clearing House to compel the secretary of state to issue a dealer's license to the company. In order to have the question finally settled for the state the case has been appealed to the supreme court of Iowa.

DEALERS STAGE CAR SHOW

Utica, N. Y., April 1-The Utica Motor Car Co. and the Otis Motor Sales Co. staged their fifth annual automobile show here recently. The exhibit drew more than 15,000 persons in the week it ran. The companies are distributors of Cadillac and Reo passenger cars and Atterbury and Reo trucks in central New York.

Seattle Show Draws 25,000 Persons





When Seattle began to figure on holding a show this year, the dealers were faced by the fact that there wasn't a building of sufficient size to hold it in. Then they learned that a new garage in the downtown district was to be completed in March and they secured the consent of the owners to its use as an exposition building. The fact that the windows were not in at first seemed to be a misfortune and later that was capitalized upon by boarding up the windows and using the boardings as signs to advertise the exhibitors. Here are a view of the building, a glimpse of the accessory displays and one

of the Buick company's booth



Exhibit Held in a Recently Completed Service Station After Numerous Delays Had Been Encountered

SEATTLE, Wash., April 2—Approximately 25,000 persons saw the automotive exposition staged by the Seattle motor car dealers last week in a new four-story garage downtown, which was leased for the show immediately after its completion.

Lack of proper show facilities in Seattle nearly compelled an abandonment of show plans this year. When it was learned that by waiting until late in March, it would be possible to obtain the new garage building, the dealers decided to present their wares in the most pretentious manner they have known.

On account of the rush of work in order to get the garage completed in time, only a portion of the windows were in place. Around the upper stories, the dealers had to board up the windows, and they conceived the idea of lettering on these boards the names of the different cars displayed inside.

On the day that the show opened, Manager William J. Coyle, who is secretary of the Seattle dealers and also managing secretary of the Washington Automobile Chamber of Commerce, announced that the entire expenses of the show had been met, leaving the attendance receipts as profit for the association.

Several very creditable displays were presented, aside from the regular cars and trucks. The Seattle police department, through its traffic squad, arranged a miniature section of the downtown district, with tiny automobiles, street cars, traffic signals and parking areas. One block was depicted "according to ordinance," while in another the cars were violating the law.

The Seattle Chamber of Commerce ar-

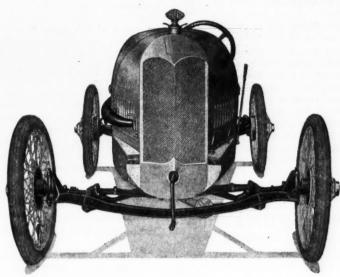
ranged a wonderful collection of scenic views from the Pacific Northwest, with colored photographs ranging from Mount Rainier to the Sunset Highway over the Cascades. The largest single motor car display was that of the Northwest Motor Co., which showed fifteen cars and four trucks.

Sales during the show, as estimated by Manager Coyle, were satisfying. They totaled as high as twenty-five retail sales for a single dealer; and a feature was the number of enclosed models which were purchased.

Dealers in the outlying territory of the state were given a special day on the closing day of the show, being entertained at a luncheon at a downtown hotel and with a High Jinks in the Crystal Pool natatorium in the evening. Boxing bouts, songs and dances marked the program.

A Good Looking Ford Speedster Design

Builder Claims He Has Attained 70 Miles Per Hour on a Straight of Way—Aluminum Pistons Used



FROM time to time Motor Age hears of a great many speedsters being built from the standard Ford chassis. Many of the designs are interesting, but we hear of few designs that have been worked out in such detailed form as that which is shown in the illustration herewith. This car was built by T. H. Jacobs, president of the Danielson Tool Co. of Wausau, Wis.

In appearance this is very pleasing in design, bearing a faint resemblance to a great many of the high priced cars. In the construction the standard Ford parts have been used throughout and the full dimensions of the Ford car have been retained. The engine is fitted with aluminum pistons and connecting rods and Burd rings are used. The camshaft is constructed especially for speed and the flywheel is tuned up to effect a better balance. A steel band is shrunk around

Two views of the Ford speedster designed by T. H. Jacobs. Standard Ford parts have been used and the

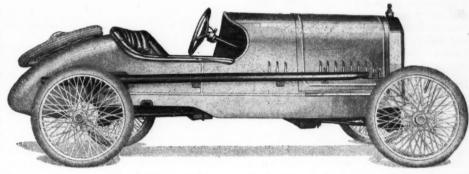
full dimensions of the Ford have

been retained

the flywheel which places the center of the inertia further out from the center where the weight will do more good, making it possible to use a lighter flywheel. The magnets of the Ford magneto have been taken off entirely, a Bosch magneto now furnishing the ignition current. The magneto is driven off the cam gear in front. Because the radiator is as narrow as it is a special fan had to be constructed and this runs on annular ball bearings. A suitable adjustment is fitted that moves the fan up and down taking the play out of the fan belt.

Special Radiator Construction

The radiator which is specially constructed is 14 in, wide and 30 in, high. It is V shape and of the cellular type. The oiling system is placed inside the crankcase which is enlarged to accommodate the oiler on the right hand side of flywheel. It is driven from a shaft to a bevel gear off the end of the camshaft. A special oiler having a capacity of 70 lb. pressure drives the extreme of oil through the crankshaft which was made hollow and ground to balance to the connecting rod in a tube into the cross-head pin, and discharges from here on the side of the cylinder.

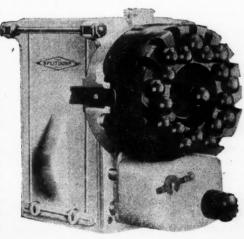


Splitdorf Eighteen-Cylinder Magneto

.....

NOT recommended as an accessory the dealer might sell, but as an interesting bit of development in the ignition field, the Splitdorf magneto shown herewith, for eighteen-cylinder engines for airplanes, produces something like 333 sparks a second, or about 20,000 a minute. Formerly magneto equipment on an eighteen-cylinder engine added about 100 lb. to the weight of the engine, because three magnetos were necessary.

With this magneto something like 60 lb. in weight is saved, and if two magnetos are used to give separate and independent sparks to each cylinder, a saving of 20 lb. in weight is still made, but two sparks are provided. This magneto is driven one and one-half times crankshaft speed.



The shaft running back through the transmission is also hollow and holes radiating from the hollow shaft discharge the extremes of oil through the transmission, in this way the transmission bearings are also lubricated. A pipe running over the transmission from the pump also distributes oil on the top of the transmission.

The valve pockets have been reamed out and enlarged so that now very large nickel-steel valves are used. Also the valve springs have been changed from twelve gage to ten gage spring metal.

The frame of this speedster is dropped from the dash to the radiator 1½ in. and is narrowed up to meet the 14 in. radiator. The front axle, which is a Ford axle is sprung cold to an arched position similar to the axle used on the Fierce-Arrow car. The front spring has been

(Continued on page 43.)

cenic with from hway ingle orth-

nated
They
retail
ature

ry of ay on g enntown n the ening.

SELLING SERVICE

(Continued from page 19)

will cost. Why not do it in your own line of business? We have used a tlat rate for the past two and one-half years and are satisfied that we cannot properly conduct our business otherwise.

To fix these flat rates requires an accurate cost system which only can be obtained by keeping accurate time record of the different operations. This is a strictly clerical job, and the chances of finding a good mechanic and a clerk combined as one are few and far between. There should be a timekeeper whose duty it is to punch the time cards, note the proper job number thereon, in addition to reporting how the time was spent. We have schooled our timekeepers to a point where they assign the mechanics to the different jobs. All our mechanics are classified and it is this that makes it possible for the timekeeper to assign them. This not only makes them thoroughly familiar with the jobs in the shop, but relieves the shop supervisors of this work.

We have absolutely no difficulty in collecting our repair bills and the answer is selling repairs at the beginning of the transaction and not at the end. I daresay that there are a lot of shops today which charge the actual time spent on the job and think they are justified in this charge, regardless of how the time was spent. It is not fair to ask a customer to pay for any work which had to be done over, if it was not performed properly the first time nor for any delay which is no fault of the customer. This should be considered as overhead.

Don't Keep Your Business a Secret

Your business should not be kept a secret. The average customer who brings his car to you has no conception of the routine necessary in repair work. The more known of the service problem, the easier it is to sell service. You know his side of the case and if you don't you should, and he should know yours. I don't mean to infer that you should allow your customers to roam through the shop at large, in fact we have made a rule not to allow them in the shop. Whenever the occasion warrants it, however, the customer is taken into the shop so that he can see his car undergoing repairs. It gives you the opportunity to explain certain things that you could not do otherwise, and it gives the customer a broader knowledge of your business. Put yourself in his position. You have a car which you think well of in the shop; a car that you have kept clean and taken a lot of pride in. You would feel rather skeptical if you could not see your car while it was undergoing repairs. In other words, do everything possible to encourage the customer and not to discourage him.

Making a definite promise as to how long certain repairs will take is something that every service manager runs into. If you make a definite promise and something unforeseen happens which delays the job, you have to do one of two things; break your promise or hurry the job through and deliver it before it is really ready. We convey the idea that we are fully conversant with the importance of getting the car out in the least possible time, because it is no advertisement to us to have the car in the shop, and there is no more incentive for us to keep the car any longer than it would be for a garage to keep a car for 3 days and charge for 1 day's stor-The uppermost thought should be to turn out each job right and do it in the least possible time.

Factorizing the Farm

(Continued from page 18)

The value of service in cutting down his overhead and decreasing his cost of selling is figured out for him on a dollar and cent basis which he can understand, and thus it is impressed upon him that the right kind of service is not an expense but is on the contrary an asset and can be made a source of profit.

How carefully the company plans every sales campaign in advance is well

illustrated in the way it put the Douglas motor truck over. The company selected the Douglas, made in Omaha. This truck was totally unknown in Texas. Therefore, a dual problem was presented.

First, it was necessary to sell the dealer on the truck itself.

Secondly, it was necessary so to locate these dealers that each should constitute a center from which motor truck influence might spread, ultimately to cover the whole territory.

In selecting the dealers the company sat down before a map and located certain strategic points. For instance, a dealer was located at Wichita Falls, in the center of the oil region; Eastland also was oil; points in the western part of the territory, like Lockney and Amarillo, were both oil and farm, etc. When a sufficient number of dealers had been selected in this manner they were invited to go to the National Tractor Show at Kansas City, thence to the Douglas factory at Omaha, as the guests of the company. The party filled two Pullmans.

At Omaha the dealers were shown the Douglas factory, introduced to the members of the Douglas company, were made known to the Omaha bankers and business men, and were afforded every opportunity to satisfy themselves as to the standing and capabilities of the Douglas company.

The net result was the sale of 247 motor trucks as initial orders.

Taking Personal Interest in Customers

(Continued from page 11)

young in Des Moines Graves did some personal work, outside of the shop among the Hudson owners of Des Moines. For one thing when the annual winter hibernation of owners came in November he sent out letters to Hudson owners calling attention to the fact that now was the time to have the car given attention so it would be ready for service when wanted. With the letters was sent a return postal card for the owner to use in advising when he desired his car taken to the service station. The cards generally succeeded in getting a personal or telephone call from the owner and definite arrangements for work were completed.

Of late years these winter letters haven't been necessary. For one thing, winter use of cars has developed to a greater extent in Des Moines and Graves found that his seed had borne fruit and Hudson owners didn't need urging to get winter service.

Graves has his office on the receiving floor and personally sees the majority of the owners who bring cars in for repairs. He believes this personal touch with the owners or drivers pays.

The office records and filing systems used by the Hudson-Jones Co. are ones which have been worked out of actual

experience in the service station, the development and adjustment of others to meet the needs of this particular shop.

Mr. Graves is modest about the organization feature of his service station. "How do you account for maintaining this organization that you are so proud of?" was a question put to him by the MOTOR AGE representative. "I give a great deal of the credit to Mr. Jones, president of the company," he replied.

"Mr. Jones takes a personal interest in every man in the shop. When the year's business has shown a good profit for the company there is a bonus for each mechanic."

Give Men Advice

"And this interest doesn't just stop at giving a bonus. Whether the going is good or whether it is bad, the men know that they can go to Mr. Jones as they would to one of their own number for counsel or advice."

That this personal equation has proved a success in the Hudson-Jones shop is proved not only by the maintenance of an efficient force, but by the fact that during the war period with its almost unending series of appeals for financial support the Hudson-Jones organization was practically 100 per cent on every campaign.

is

he

ck

a in ind

naien een

in-

the

ıll-

the

emere and ery to the

mo-

ners

hop.

or-

ion.

ning

coud

the e a ones, lied. erest the orofit

op at ag is men es as mber coved op is ce of that most

ncial

ation

every

Ctandard Mechanical Operations



in Tractor Service

John Charles Thorpe, M.E.

and Gustav Howard Radebaugh



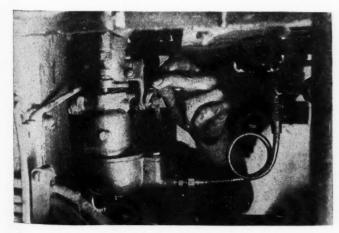
EDITOR'S NOTE: The two pages herewith are the tenth of a series covering the service operations on tractors, although the same can be applied quite generally to passenger car and truck engines. In last week's issue of MOTOR AGE we told of the principles of carburetion with sectional view of carbureter, showing construction. This installment deals with the troubles caused by a damaged needle valve or seat and how to correct it and obtain the correct adjustments. It is often the case that the more simple a trouble may be the more difficult it is to locate. It is with this in view that we present this series which deals with the everyday problems that may confront the tractor owner and tell here how to locate and remedy these troubles.

PART X

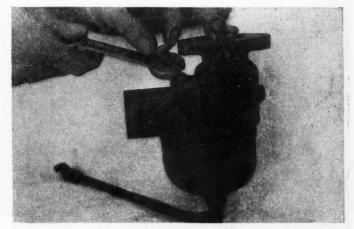
Carbureter Troubles—Damaged Needle-Valve and Seat

It sometimes happens that the persistent effort to correct carbureter troubles by the ordinary operations of adjustment does not attain proper results. This is often due to damaged or disarranged parts of the carbureter. On account of the rather delicate construction, it is sometimes found that the needle valve and seat are damaged.

The repair is quite a simple operation, but requires care in its completion. The importance of the work is evident when it is realized that the opening of the needle valve is the controlling factor in the fuel mixing, if other construction details are in proper condition and functioning correctly.



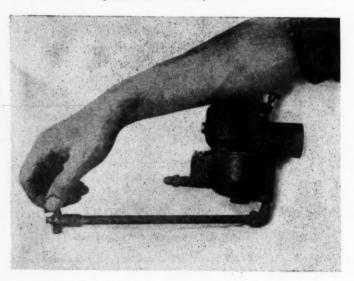
1.—Carbureter in place on engine. Note the looped supply pipe from the fuel supply tank to the carbureter bowl. This is to provide flexibility so that jarring of the machine will not damage connections



2.—Loosen binding screw or lock nut on needle valve. Note—In the above view and those following, for the purpose of simplifying instruction, the carbureter has been removed from the engine



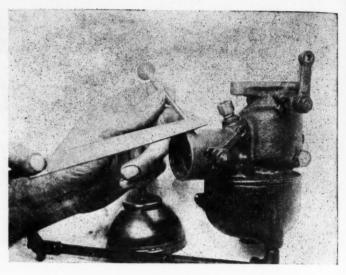
3 —Turn knurled adjusting screw to the right until needle valve is felt to take its seat gently. It is always best to begin in this manner, making a complete adjustment in this operation



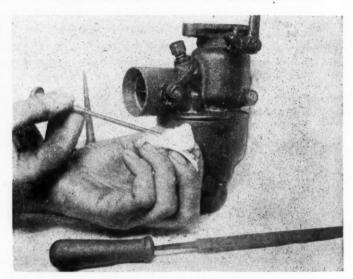
4—Shut off fuel supply by closing fuel tank valves and then drain fuel from carbureter through draincock



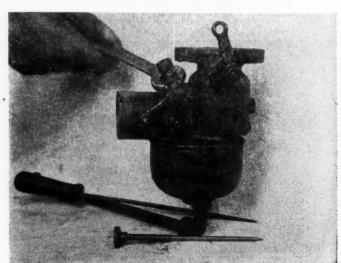
5—Remove needle valve by lifting it carefully from its position after unscrewing it completely from its own fastening and also loosening the binding nut or lock screw to permit of easy removal



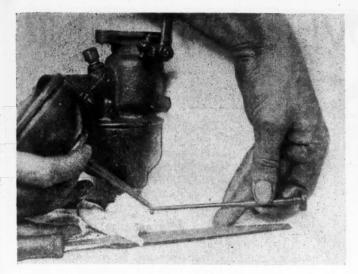
6—An inspection of the needle valve reveals a blunt, broken or bent point. Smooth tip or point very carefully with a fine file, using a smooth rotary motion of needle as file is passed over it to give proper taper



7—Wipe off needle valve with clean cloth (or waste) and inspect carefully for rough or uneven spots. Repeat filing operation carefully until the valve appears to have a perfect tip, in the shape of a cone



8.—Unscrew and remove binding nut from the body of carbureter. This is necessary for the procedure in repairing the valve seat



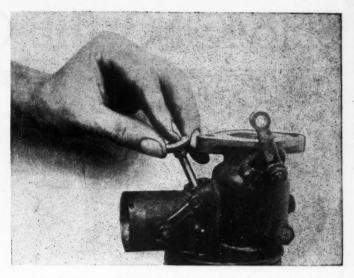
9—Cover point of needle with a good grade of engine oil. On account of the softness of the metal, this oil is the only "grinding compound" that is necessary.

Emery or other material should never be used

After a few minutes of this procedure, remove needle valve, clean and inspect. Repeat until the marks on the tip indicate an even bearing. Now re-assemble and proceed with carbureter adjustment.

Turn adjusting screw to the left one and one-half turns. Start the engine, and carefully note the running condition of the engine with the throttle valve about onefourth open.

Turn adjusting screw about one-fourth turn to the right. This "leans" the mixture. Open the throttle wide and note if engine "coughs" or "spits." If so, mixture is too lean and adjusting screw should be turned to left to "rich" the mixture.



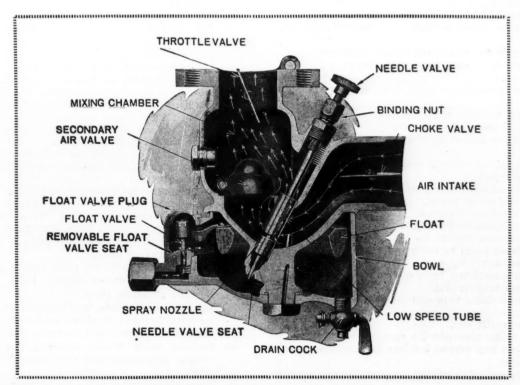
10—Insert needle valve carefully through the opening and let it rest carefully on its seat. Grind in the seat by an even rotary or oscillating motion, with a very gentle pressure

If engine speed falls off as adjusting screw is turned to the left, the point of too rich mixture has been reached.

After making a change in the adjusting screw sufficient time should be allowed to elapse to allow the engine to accommodate itself to the new condition.

Close throttle to one-fourth opening again and repeat this "cut and try" method, noting very carefully the point in the adjustment where the engine runs most smoothly and where the speed is a maximum for a fixed position of the throttle valve.

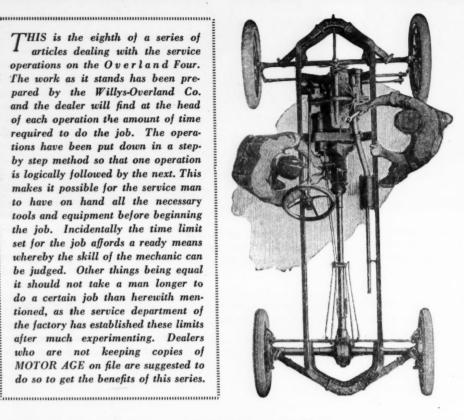
After final adjustment is made, tighten the binding screw or nut, being careful to see that the position of the needle valve has not been changed in the operation.



SECTIONAL VIEW OF CARBURETER

SERVICING THE OVERLAND FOU

THIS is the eighth of a series of articles dealing with the service operations on the Overland Four. The work as it stands has been prepared by the Willys-Overland Co. and the dealer will find at the head of each operation the amount of time required to do the job. The operations have been put down in a stepby step method so that one operation is logically followed by the next. This makes it possible for the service man to have on hand all the necessary tools and equipment before beginning the job. Incidentally the time limit set for the job affords a ready means whereby the skill of the mechanic can be judged. Other things being equal it should not take a man longer to do a certain job than herewith mentioned, as the service department of the factory has established these limits after much experimenting. Dealers who are not keeping copies of MOTOR AGE on file are suggested to do so to get the benefits of this series.



PART VIII—The Engine

THESE valuable articles—Servicing the Overland Four-will run serially each week until the service operations on the entire car have been explained. This week deals with the

Engine

Next week will be a continuation of the service operations on the engine.

Keep a file of MOTOR AGE for ready reference. The flat-rate system of estimating on a job has been proved the best plan to make your service work more profitable, eliminate complaints and please your customers. The time given here for each service operation can be adapted to the flatrate system of estimating cost of repair jobs on cars of this class.

TO REMOVE AND REPLACE CLUTCH ASSEMBLY, CLUTCH SPRING, OR CLUTCH SHAFT FRONT ANNULAR BEARING

Time: 3 hrs.

With installation of spring, 3 hrs., 15 min.

- 1. With chain falls or crane, take weight of car off rear spring.
- 2. Remove cotterpin from brake rod and service brake pedal clevis pin.
- 3. Remove clevis pin.
- Remove wing adjusting nut from hand brake lever
- 5. Remove cotterpins from axle spring bolt nuts.
- Remove two %-in. nuts from spring bolts.
- 7. Drive out bolts.
- 8. Disconnect speedometer cable from speedometer drive shaft.
- With proper blocking under torsion tube, roll rear system out from under the car.
- 10. Drain oil from engine by removing plug under clutch housing.
- 11. Remove 5-in. cap screws, lock washers and nuts from clutch pedal pads.
- 12. Remove clutch and brake pedal pads.
- 13. Unhook accelerator spring.
- 14. Unscrew accelerator button.
- 15. Disconnect speedometer cable at speedometer head and remove floor boards.
- 16. Remove clutch pedal by taking out %-in. lock bolt, lock washer and nut.
- 17. Remove Woodruff key from clutch fork shaft.
- 18. Remove foot brake pedal.
- 19. Remove four 16-in. nuts and lock washers from gearshift box.
- 20. Remove gearshift box.
- Block up under transmission case.
- 22. Take out all cap screws holding transmission assembly to engine.
- Remove transmission assembly screw in one starting motor cap screw .
- 24. Depress clutch spring by placing two 34 by 11/2 by

- 21/2-in. hardwood blocks between clutch thrust bearing and clutch plate.
- 25. Remove eight 16-in. cap screws, and lock washers from clutch plate.
- 26. Remove clutch plate.
- 27. Take out clutch pressure plate.
- 28. Drive out three anchor pins, using drift-punch through flywheel.
- 29. Take out clutch driven plate.
- Remove driving plate, shown in Fig. 17.
- 31. Remove driven plate. If clutch shaft front bearing in flywheel is damaged, renew. To replace clutch spring. put clutch plate assembly in arbor press and exert enough pressure so that the wood block can be removed; then, gradually release pressure until spring can be lifted out. See Figs. 18 and 19.
 - If the clutch thrust bearing is damaged, remove lock wire from nut holding bearing to clutch sleeve and remove nut. Drive off bearing.
 - Put bearing on sleeve and drive to shoulder.
 - Put on bearing nut and lock with locking ring.
 - Put in spring.
 - Put clutch sleeve assembly in position and place under arbor-press. Slowly depress spring placing clutch levers in clutch lever collar. When clutch thrust bearing is through clutch plate, incorporate wood blocking.
- 32. Replace first driven asbestos plate in flywheel .
- 33. Replace driving plate.
- 34. Drive in three pressure plate anchor pins.
- 35. Replace second driven asbestos plate.
- 36. Replace pressure plate.
- 37. Replace clutch plate, making sure that all holes line up with holes in flywheel, and bolt with eight 16-in. cap screws, lock washer under head.
- 38. Remove wood blocks between thrust bearing and clutch over plate and unscrew starting motor cap
- 39. Place transmission assembly in position on blocks and insert clutch shaft in clutch. It may be necessary to

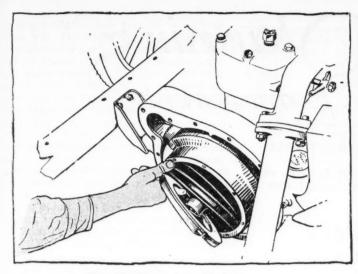


Fig. 17-Removing clutch plates

hand crank the engine in order to get the clutch shaft started in the driving disk.

- 40. Place clutch shifting fork over clutch thrust bearing.
- 41. Put key on clutch fork shaft and install clutch pedal.
- By pushing out on clutch pedal will draw the transmission assembly into place.
- 43. With sixteen %-in. cap screws, lock washers under head, bolt transmission assembly to engine base.
- 44. Place sliding gears in neutral.
- 45. Place gearshift lever in neutral.

ear-

rom

ugh

g in

ing,

xert

rering lock

nder lutch

bearking.

line

5-in.

and

cap

s and

ry to

- 46. Assemble gearshift box on transmission.
- Put four lock washers and four nuts on gearshift box and tighten securely.
- 48. Connect hand brake rod to hand brake lever with wing adjusting nut.

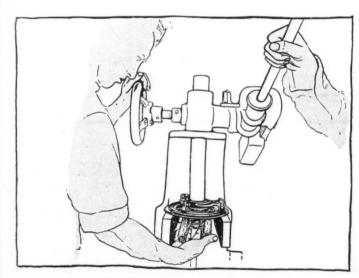


Fig. 18-Releasing clutch spring in arbor press

- 49. Remove clutch pedal and clutch operating shaft key.
- 50. Assemble brake pedal on clutch operating shaft.
- 51. Put key in clutch operating shaft.
- Assemble the clutch pedal, clamping with clamp bolts, lock washers and nuts.
- 53. Connect foot brake rod with clevis pin and cotter.
- 54. Put in floor boards.
- Put on brake pedal pads with clamp bolts, lock washers and nuts.
- 56. Hook accelerator spring to accelerator rod.
- 57. Screw on accelerator button.
- 58. Connect speedometer cable to speedometer head. Roll

rear system under car—one man steering propeller shaft into universal shaft. It may be necessary to place transmission in low gear and hand crank engine to line up universal joint with propeller shaft.

- 59. Put in left rear spring bolt.
- 60. Lower frame and put in right rear spring bolt.
- 61. Replace two %-in. bolt nuts.
- 62. Cotterpin.
- Replace hand brake rod in hand brake lever connecting with wing adjusting nut.
- 64. Connect speedometer cable to speedometer drive shaft.
- Connect brake rod to service brake pedal with clevis and cotterpins.
- 66. Remove chain falls or crane.

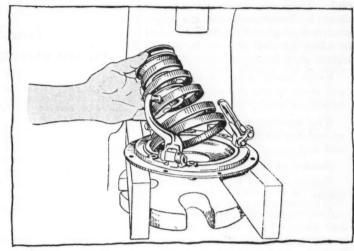


Fig. 19-Clutch spring released

TO ADJUST CLUTCH

- Time: 15 min.
- 1. Remove floor boards.
- Remove clutch housing cover, by unscrewing five fs-in. cap screws and lock washers.
- 3. Crank engine slowly by hand until adjusting screw incorporated in slot of clutch plate is brought to the top. Loosen this cap screw and turn engine slowly until the other adjusting screw is brought to the top. Loosen this screw and depress clutch pedal and push the loosened cap screws to the right, or clockwise direction, and lock firmly in place, as shown in Fig. 20.
- 4. Put on clutch coverplate.
- 5. Put in floor boards.

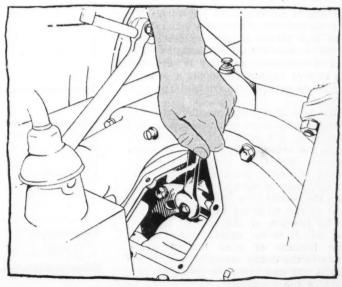


Fig. 20-Proper methods of adjusting clutch

gning

MOTOR AGE is receiving many inquiries for garage plans which do not give sufficient information to permit an intelligent reply. There are certain things which should be known to lay out the proper plan for a garage, and inquiries are urged in asking for such plans to be used to include the following information:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected they will be.

Number of cars on the sales floor. Number of cars it is expected to

Number of men employed in re-

And how much of an accessory department is anticipated.

No. 207

SERVICE STATION ON TWO LEVELS

I am to build a service station on a lot 120x44. What I want is for you to sub-mit me the price for the plans for same.

mit me the price for the plans for same. I am enclosing a sketch. Basement is 126 ft. The grade makes the first floor, at rear 14 ft. off of ground. Drive out in basement. Light from front and rear, sides are dark, buildings on side. Building to be built of reinforced concrete, reinforced with American 6-in. stay wires. Remember the grade falls to the rear and it is 14 ft. in the length of the building. I wish to begin work soon and would like an early submission of same.—H. J. Hawkins, Eminence, Mo.

There is no charge for our plans, but our service stops with the general design and layout of the building. We could not possibly furnish detailed plans and specifications on every inquiry that we receive without employing a corps of architects and engineers of large proportion.

We note that you have indicated the elevator only between the basement and first floor, but suggest that you carry it to the second floor also. The extra expense would be slight, the rental would be greater and the elevator would be all ready in case you wanted to absorb the second floor into your own business as you no doubt will before long.

The position of the row of posts at one side is rather unusual but is advisable because of your limited width. Posts in the center would be very much in the way and two rows would be possible in the basement. They would be very much of a handicap on the first

CONDUCTED BY TOM WILDER

floor. The greatest span is 27 ft. and this can be very easily handled with I beams or concrete.

No. 208

TIRE AND BATTERY SERVICE STA-TION

Will you please advise me as to the best inside arrangement, for a tire and battery service station. The space we battery service station. The space we are to have is 25 ft. by 50 ft. and will only have an entrance from the front. and will

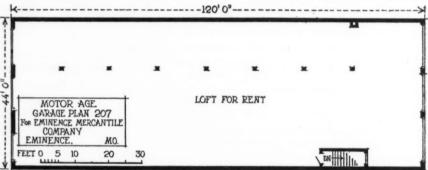
Will you please send me a sketch of the above and oblige.—R. S. Watson, Union City, Tenn.

This space is rather small for both battery and service stations, but if it is utilized to the best advantage and no unnecessary material allowed to accumulate a large volume of business may be handled here.

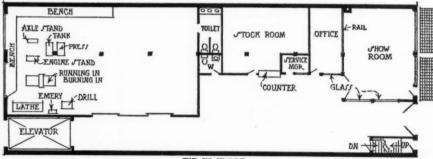
Perhaps we have made the store or sales room part larger than is actually necessary, but only a few feet could be taken from it at best and this would not enhance the shop to a great extent and would cut down the sales room so much that it would appear cramped.

The main thing in arranging your benches and equipment is to avoid confusion. Keep the job whether battery or tire going in a general direction. A battery, for instance, if it is to be completely overhauled, must go from the receiving rack to the steamer, then to the disassembling table, then cleaned, plates straightened, replacements made, parts reassembled, billed, sealed, terminals burned in, charged and returned to delivery rack.

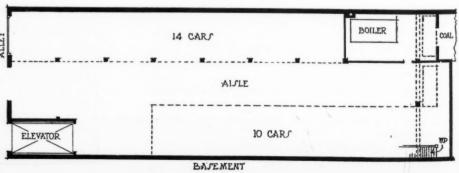
From disassembling to assembling the



JECOND FLOOR



FIRST FLOOR



No. 207-Service station on two levels

T

ot

a

h

УA

a-1e

to

d,

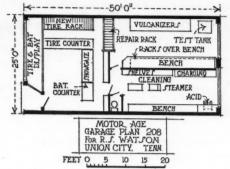
e.

i-

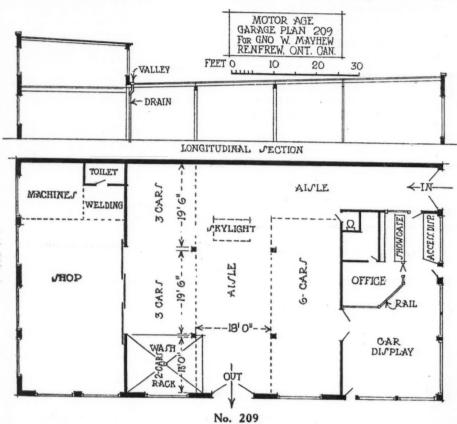
to

he

parts should be kept together on a tray that will facilitate their moving from one bench to the next. It is much better to do the job this way than scatter the parts about on the bench and then carry them around to be repaired or fetch tools to this bench to repair them. The trays can be made in such a way that they can be stacked in a neat pile when not in use and perhaps when in use too with the parts, arranged on them. The use of trays in this manner will tend to give greater efficiency and less confusion and lost parts.



No. 208-Tire and battery service station



No. 209

GARAGE IN CANADA

I am enclosing a rough sketch of a garage which I intend building 55 ft. by 100 ft. I would like a showroom facing Main St. to hold two cars. Also an office and accessory stock room along the front. Will have an entrance from Main St.; also one from Hall St. Where would you advise putting these entrances? You will notice in the cut that I will have to put four posts in the center of the building to support the roof. This center part will be about 55 ft. Square

The work shop will be at the back about 25 ft. by 55 ft., with a basement under it. I think I can have an outside entrance into the basement from the back. Would this be a good place to have a wash room? I also intend putting battery service plant down there, as well as the furnace. You will notice that there is a brick block running along side of my building. Where would be the proper place to put skylights to light this side of grance?

as well as the furnace. You will notice that there is a brick block running along that there is a brick block running along side of my building. Where would be the proper place to put skylights to light this side of garage?

I intend to have a flat roof sloping from front to back. Would 10 ft. be high enough for the ceiling at the back of the work shop? The front of the building will be about 16 ft. high. What I would like to know particularly about would be the entrances and the show room and office where these would be

best located. I will have to have a small door into the office or show room from Main St. Hoping to hear from you in the near future, I remain, Jno. W. Mayhew, Renfrew, Ont.

The general scheme of your layout is just about as we think it should be. The depth of the central garage section we would cut down to 50 ft., however, adding the extra 5 ft. to the showroom and accessory department, as they are none too large, as we show them.

If the ground is low in the alley so you can get into the basement without using too much of the basement space up in a ramp your idea is all right, but to go into the basement from the first floor level inside of your lot line would call for a sacrifice of at least one-third of your shop space and the same amount of your basement and would not be worth that much after you had obtained it. A basement without daylight is an impossible place to make men work, and it would be better all around to place your west rack where we show it and build a second story over the shop for battery and tire shops.

We would advise keeping the height

of the ceiling at least 12 ft. in the clear under beams. In a trussed roof the bottom of the trusses are usually kept at least 12 ft. from the floor, making the ceiling 16 to 20 ft. high. This gives better circulation of air with a chance for the smoke and fumes to escape above the breathing line of the occupants.

If your side street is in good condition we see no real need for a front entrance, you would thereby save a lot of room for accessories and possibly a woman's rest room if you have need of one. You would also gain space for two more cars in the garage.

By spacing the parts as we show them you gain an extra car space on each side of the aisle, but the quarters are pretty snug and it may be you would rather forego these spaces for a little more freedom.

A Good Looking Ford Speedster Design

(Continued from page 35.)

straightened and shortened at both ends, being necessary after springing the axle. The springs are brought closer together so that the spring is shortened an inch on each end. The radius rod is crotched on the front axle into the spring where it is fastened to the axle on the bottom.

The gasoline tank is contained within the body at the rear of the car. Pressure feed is used for the fuel and the pressure is maintained by a pump that is fitted on the side of the engine. This pump also serves to maintain the pressure on the oil.

The driveshaft which is a stock Ford driveshaft is turned up from end to end and put in perfect balance. It was found that the stock driveshaft was slightly out of balance because it was not forged to the exact balance that the rebuilder desired. The rear axle shafts are also treated in this fashion. The roller bearings on the outer end of each axle were taken out and a sleeve which projects into the hub was inserted therein. The rear brakes are entirely dispensed with and a ring is riveted inside the brake drum in which is forced an annular ball bearing 4-57-100 in. diameter.

The roller bearing just ahead of the pinion was replaced by two New Departure double-row ball bearings. The end thrust bearings in the axle were replaced with ball thrust bearings. The car is finished in light green, and light green upholstering is also used. The wheels are white in color. A nickel plated radiator is used which makes the whole design very attractive. Fitted to both the front and rear axles are Hartford shock absorbers, which add to the riding qualities of the car.

The standard gear in the rear axle is still retained, but the owner claims that with the changes he has made he has been able to make 70 m.p.h. on a straight of way.

The Readers' Clearing House Ouestions and Answers

DELCO LIGHT PLANT

Q—The rubber blocks in the generator of my 1916 Studebaker Four fly out and cause trouble? Why is this?

2—What causes the battery indicator to stick on slowing charge, with the engine stopped, until the instrument board is jarred when it swings off?

3—Publish wiring diagram of a 3-4 kw. Delco light plant showing internal connections.

4—Publish cross-sectional view of the engine and generator.

5—Publish a cross-sectional view of the armature and field winding.—J. R. Rapaum, Buffalo, N. D.

1—We do not know of any rubber blocks in the generator used on Studebaker but think probably reference is made to the carbon brushes. If they have a tendency to fly out and cause trouble it may indicate weak brush springs or a rough condition of the commutator which is probably a result of the mica being too high in spots.

2—This probably an indication of loose connections or dirty contact points. If the contact points are sticking together which can be determined by removing the relay cover, separate them carefully and clean the points with a very fine file or a little very fine sand-

CONDUCTED BY ROY E. BERG

Technical Editor—Motor Age

T HIS Department is conducted to assist Dealers, Service Stations, Garagemen and their Mechanics in the solution of their repairs and service problems.

In addressing this department readers are requested to give the firm name and address. Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been asked by some one else and these are answered by reference to previous issues. MOTOR AGE reserves the right to answer the query by personal letter or through these columns.

The Electric System

.....

paper. Great care must be taken or the relay will be thrown out of adjustment.

3—This diagram is shown in Fig. 1.

4 and 5—See Fig. 1.

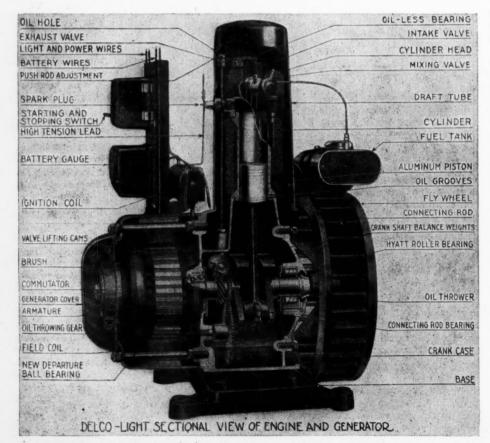


Fig. 1

BATTERY OVERHAULING

Q-Does a battery have to be charged or discharged before overhauling?

2—After tearing down battery are the positive and negative plates washed; and if so should distilled water be used?

3—Would you advise overhauling a bat-

3—Would you advise overhauling a battery where both positive and negative are required?

4—What should be the charging rate of a 6-volt, 80 ampere hour battery after it has been overhauled?

5-How can one tell which side of battery is grounded?

6—Explain how battery is charged from generator.

7—When positive side of battery is grounded, does it enter positive side of battery?

8—Publish diagram showing method of grounding generator on Ford and Dodge cars if battery is removed.—Clifton B. Norris, Willow Shade, Ky.

1—It is not necessary to discharge the battery in overhauling. Simply drain the battery of the electrolyte and dissemble the battery.

2—The plates ought to be thoroughly washed with distilled water and then dried.

3—We do not think a battery in such bad condition as to require both positive and negative plates is worth while repairing.

4—After a battery has been overhauled and is prepared for a charge a current of about four or five amperes should be used.

5—The question as to which side of the battery is to be grounded depends upon the wiring system used. The only thing to do is to ground the side called for by the wiring diagram of the car.

6—After the cranking operation has been performed, the engine of course drives the generator and when a car speed of about 7 m.p.h. is attained the generator is producing a voltage higher than that of the storage battery which results in a flow of current to the battery. The most common system of regulation is known as the third brush regulation. A complete explanation as to the operation of the third brush regulation system was published in the March 25 issue of Motor Age.

7—If the positive side of the battery is grounded it flows to the negative.

8—It is not necessary to give a diagram showing the method of grounding the generator as it only requires a small copper wire from the generator to the frame of the generator, name plate or some other similar part that is aground.

OWEN MAGNETIC WIRING DIAGRAM

Q—Publish diagram showing the electrical construction of the Owen Magnetic 2—What make of magneto generates direct current?

3—Publish best advanced theory of a condenser.—R. F. Dickson, Kansas City.

m

he

le

ly

en

in

th

th

ed

nt

be

he

on

ng

by

nas

rse

car

the

her

ich

at-

eg-

gu-

to

ıla-

rch

ery

dia-

ling

nall

the

or

ınd.

RAM

elec-

etic.

of a

1—Wiring diagram of the Owen Magnetic is shown in Fig. 7.

2—The magneto generates a variable electric pressure as shown in Fig. —. There are several companies on the market manufacturing a magneto generator. The Bosch Company has a magneto generator system which, of course, provides direct current and full information can be obtained by writing to them.

3—The condenser used in combination with a jump-spark coil acts as an electrical shock absorber. It is connected across the breaker contacts and when they open, the energy which would normally go into the arc is stored in the condenser, thus eliminating the serious troubles due to the arc. The current in the primary circuit is reduced to zero more quickly and a higher voltage is produced in the secondary winding.

The operation of the condenser might be compared to the operation of a diaphragm, D, stretched across a tank or pipe connected around a valve, V, as shown in Fig. 9. If the valve be suddenly closed the diaphragm relieves the strain on the valve to a great extent, and thus allows the flow of liquid to be reduced to zero in a shorter time than it could be if no diaphragm were used.

OWEN MAGNETIC

Q-Illustrate the complete mechanical construction of the Owen Magneto.-R, F. Dickson, ansas City, Mo.

The Owen Magnetic makes use of an actual electric transmission known as the Entz. The arrangement of this system permits the changing of all speeds by a small lever similar to a spark lever mounted on the steering wheels. As will be noted in Fig. 4 there is a generator, the field magnet of which is attached to the engine crankshaft and which takes the place of a flywheel. The armature is connected with the driveshaft. This transmits the power of the engine by the current established in its circuit which is due to the speed difference on what would be termed high speed.

The clutch generator member makes an elastic clutching and transmitting means, but more than the full torque of the engine cannot be transmitted. For a greater torque an electric motor is used, the armature of which is mounted on the driveshaft and receives its current from clutch generator. The clutch generator is shown at the left in Fig. 4, FR representing the field, FW the field winding and PP the pole pieces. This portion revolves with the crankshaft. Within this portion is the armature which is secured to the continuous shaft S and connected to the driveshaft at the coupling X.

At the right is the second part of the system, practically a duplicate of the first. Its armature AA is carried on the same shaft as armature A. Outside this is the usual field part with rings FR and windings FW, pole pieces and brushes B. Fields FR may revolve without any motion of A. The several different speeds are obtained by varying the relative speeds of FR and A. On direct drive the armature is short-circuited on itself, and the armature A is carried with it. With

T O assist readers in obtaining as a unit all information on a certain subject MOTOR AGE segregates inquiries in this department into divisions of allied nature. Questions pertaining to engines are answered under that head and so on.

THE ELECTRIC SYSTEM

J. R. Rapaum	Buffalo, N. D.
Clifton B. NorrisWi	llow Shade, Kv.
R. F. Dickson	ansas City, Mo.
A. Brown	Omaha, Neb.
W. Beard	Galesburg, III.
D. V. Russell	Laona, Wis.
Riley V. Whatley, City Ga	rage
Br	idgeport, Texas
C. F. Hoelscher	Huntsville, Ill.
H. GrandsburyI	
B.,	Chicago
E. F. Chaskel, Chaskel Au	
***************************************	Florence, Ind.

ENGINES

Little Book Ark

H. O. Coleard

Roy McKinney	San Angelo, Texas
W. O. Wilcox	Rosemont, Minn
Joseph Ruzicka	Chicago
Herbert H. Shields	New York
John R. Peters	Peru, Ind.
Alex R. Wilson	Chicago
Francis Bauer	
Sidney L. Freers	Terre Haute, Ind.
Herington Motor Co	
Theo. S. Dahl	Volga, S. D.
Harry H. Dunham	New Salem, Ill.
A. W. Blackmer, Belle	evue Garage Co.
	Bellevue, Mich.
Robert N. Adams	
J. M. Phares	
W H Huches	Magdalana, N. M.

***********************		,
Robert N. Adams.	Avil	la, Ind.
J. M. Phares	Marshal	l, Okla.
W. H. Hughes	Magdalen	a, N. M.
Schardin, Nelson	and Neale	
***************************************	Lake Benton	, Minn.

CARBURETION

MISCELLANEOUS

н	erm	an	Meyers	East	Molin	e.	m.
H	. S.	Br	inggoldWest	Con	cord,	Mi	nn.
D	. A.	M.	Gordon	Irvin	gton.	N.	Y.
-							

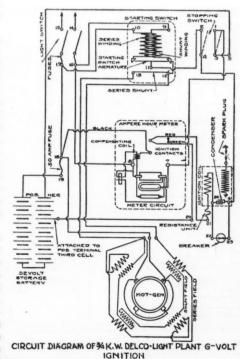


Fig. 2

the exception of a slippage of 1 to 4 per cent between the field and the armature the driveshaft would be driven the same revolutions per minute as the armature.

The explanation just given may not be easily understood because of its technical nature and for that reason a simple explanation may be better. Refer to Fig.

A-Ordinary type of keeper.

B-Magnet on pedestal with hand crank to revolve it.

C—Piece of round steel placed within magnet on same line of travel. It is apparent that by turning the crank, the magnet will revolve and the attraction of the magnet B to the bar C will cause C to revolve with it.

Instead of B being now revolved by a handcrank it is revolved by a gasoline engine and B taking the place of a flywheel revolves at engine crankshaft speed regulated by a throttle. B is a revolving field, C part of the propeller shaft and let C be referred to as an armature. When the car is running in high speed C, being attracted, follows B because it is magnetically locked. There is no mechanical connection between the rear axle and engine, magnetism alone transmitting the power. With this magnetic attraction between the two at its highest point the drive practically is locked. Consequently, when operating in this almost direct drive, extreme difficulty may be realized in climbing steep grades or pulling heavy loads. To overcome this a speed reduction has been provided so, by reducing the magnetism between the first and second part, the engine crankshaft revolves faster than the driveshaft. The ratio between the two depends upon the amount of reduction in the magnetism.

In effect we are now driving through what may approximately be termed a slipping clutch in the gear transmission car. When C and B cease to be magnetically locked it is evident B will revolve faster than C. In so doing electricity is generated and led to D. Armature E, which is the same as C and mounted on the same propeller shaft takes the electricity generated by the slip and acts as a power booster of the propeller shaft which makes a greater number of speed reductions possible.

The Owen-Magnetic power plant is shown in Fig. 18. The entire difference between this and other gasoline cars lies in the magnetic transmission. There is no change in the gas engine for its operation. The method of transmitting power eliminates mechanical parts found in other automobiles, namely engine flywheel, starting motor with its lever shafts and switches, and the transmission gears. The sequence of events is a gasoline engine driving a generator and the drive through a transmission involving the partial transformation of mechanical energy into electrical power. The fields provide enough weight to take the place of the engine fly-wheel. Fig. 4 illustrates how the two fields and the two armatures of the Owen Magnetic are situated. The generator field revolves about

the armature, which is keyed to the shaft, while the motor armature, which is also keyed to a propeller shaft, has a stationary field.

PHILBRIN IGNITION

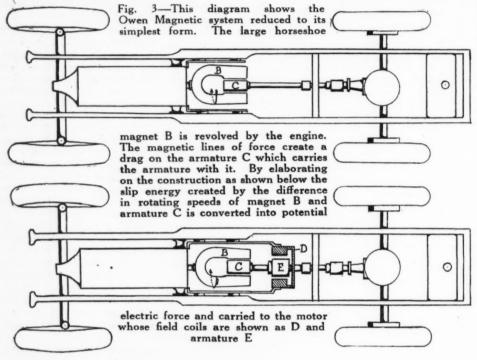
Q—Explain and describe the Philbrin ignition system.—A. Brown, Omaha, Neb.

The Philbrin ignition system, manufactured by the Philips-Brinton Co., is both a single and continuous-spark system. Either type of ignition may be used at will. The inter-relation of the various parts of the combined breaker-distributer unit is shown in Fig. 8. The distinctive feature of the system is the breaker, which supplies a single spark of great intensity, the quality of the spark remaining practically the same for all engine speeds.

The construction of the breaker is shown in Fig. 12 and its operation in brief is as follows: Rotation of the cam C, which is in effect a series of tiny triggers, pushes out the arm A, thus closing the contacts, which normally are open. When a trigger passes the arm the contacts are separated by the spring (S) instantly. The contacts are held together for approximately 31/2 deg. of the revolution of the cam. It is this breaker mechanism that gives the single spark. If the cam is rotated the wrong way the triggers simply push the arm A out of the way, it being mounted in a speciallyshaped hole in its supporting member, as shown in Fig. 12. The continuous spark is controlled not by the breaker mechanism but by a tiny vibrator of special form contained within the switch assembly.

The vibrator operates at four to five times the speed of the ordinary vibrator. As long as the engine is running a continuation of sparks is produced, and this stream is distributed, as are the sparks from the single-spark portion of the system, by the distributer mechanism. The distributer has a long arm with a blade of peculiar force. This blade does not touch the high tension terminals molded into the Bakelite cover but passes in very close proximity to the terminals, and the spark passes a small air gap. The reason for this long blade is to insure a continuous stream of sparks at the plug during a considerable portion of the piston travel. This stream of sparks is an advantage when the engine is cold or the carbureter is slightly out of adjustment, for it practically insures firing the mixture.

The Philbrin switch provides for two sources of current, the usual storage battery and an auxiliary set of dry cells, the arm of the switch being moved in one direction for the storage battery and the other for the dry cells. The lever which controls the operation of the continuous spark and single-spark operations is a continuously rotary plug. This plug is marked alternately M and S, signifying whether the main or secondary systems are in operation. This special switch also, reverses the polarity of the circuit each time it is turned, thus increasing the life of the contacts. The ignition is mounted in a waterproof case and may be mounted on the dash or, in some in-



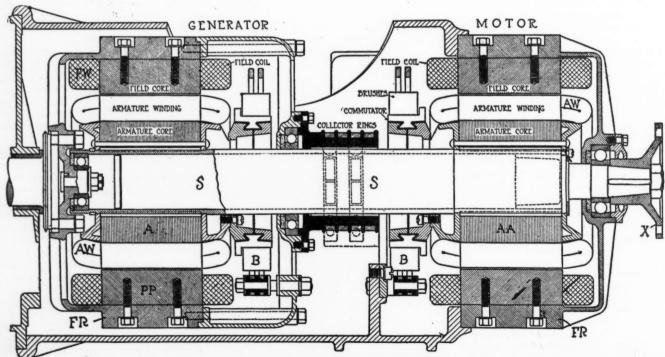


Fig. 4—A cross-sectional view of the generator and motor of the Owen Magnetic. The armature of the generator and motor are directly connected to the crankshaft of the engine and rotate with it

k

h.

re

g

nd

1e

h-

m

is

r-

er

he

all

de

ole im ently in-

wo

atlls,

ne

the

ich

ous

a

is

ing

tch

nit

the is nay

in-

stallations, directly with the distributer mechanism.

The system has but one adjustment, and this has to do with the opening of the contacts on the main, or single-spark system. The gap between the contacts should be from .025 to .030 in. The method of making the adjustment is obvious from an inspection of Fig. 12. The vibrator for the secondary system is housed in the switch assembly and will never require any adjustment. The manufacturers strongly urge that it never be touched.

1914 REO WIRING DIAGRAM

Q—Publish wiring diagram of the 1914 Reo the Fifth, showing coil and switch connections; a National magneto was used. —W. Beard, Galesburg, Ill.

This system is shown in Fig. 6.

DISCHARGING STORAGE BATTERIES

Q—In charging batteries we get current from a 110-volt D. C. machine, located about 200 ft. away. Recently we had two 6-volt batteries hooked in series with a bank of lamps pulling about 12 amp. and failed to pull the switch when the dynamo was stopped. Would leaving the batteries this way overnight materially injure them? The dynamo is a 10 kw.—D. V. Russell, Laona, Wis.

The leaving of the batteries on a circuit that was drawing 12 amp. would not harm them but after eight hours they would be pretty well discharged. The fact that the generater was in the circuit would have very little effect as the windings are low of resistance.

STARTING, LIGHTING AND IGNITION SYSTEM ON OVERLAND 79

Q—Publish wiring diagram of the Gray & Davis and Splitdorf dual ignition as used on the Overland 79.—Riley V. Whatley, City Garage, Bridgeport, Texas.

Since the starting and lighting systems are two separate things it will be necessary to give two illustrations. Fig. 10 shows starting and lighting system and the ignition diagram appeared in March 25 Motor Age.

SMALL ELECTRIC LIGHT PLANT

Q—On a light plant of 6 K. W., D. C., 110-volt, which would be the cheaper to run and more reliable—a four-cycle or two-cycle engine?

2—What is the fuel consumption per hour at full load of a 10 h. p. oil engine?

3—For a small lighting plant, which will run day and night, which is the best type of generator, a D. C. or A. C.? We are going to use storage batteries with 60 cells.

4—Using a 10 h. p. engine, 6 K. W. generator, with 60 batteries for a 24-hour service, and with distillate at 15 cents per gallon, kerosene 20 cents, and gasoline 30 cents, what would be the current charge per K. W. for the service?—H. Grandsbury, Driftwood, Okla.

1 and 2—The most reliable and best engine for a job of this kind would be a four-cycle engine. If an oil engine is used you will probably have a consumption of 1¼ lb. per brake hp. hour.

3 and 4—The outfit which you propose to use is extremely small and of course it is impossible for us to advise you as to what kind of an outfit to purchase so as to run your plant profitably without more details of what is wanted. With distillate at 15 cents a gallon, kerosene 20 cents a gallon, gasoline 30 cents a gallon

the actual cost of producing a kilowatt would be about 3½, 4¾ and 6¾ cents respectively. This does not include overhead. We cannot state what could be charged for the power without knowing conditions. We believe that you would have to charge at least 10 or 12 cents for K-W in order to conduct a business anywhere near a profitable basis.

OAKLAND WIRING DIAGRAM

Q—Publish wiring diagram of the 1916 Oakland, 32-B. Point out, in particular, where ground connection is made at back of ignition switch. This outfit has a four wire cable leading from the switch to generator and distributer and is difficult to follow.—B. Chicago.

Diagram of the 1916 Oakland 32-B is shown in Fig. —. The diagram does not show a four wire cable from switch to generator and distributer. But since

the diagram shows the terminals at the back of the combination switch you can easily trace out the wiring.

CONNECTING SPOTLIGHT ON ESSEX

Q—Where is the best place to connect a spotlight on an Essex so that it will be independent of all other lights. We prefer to connect it directly to the Delco lighting switch but seem to get a grounded circuit. There are two terminals not in use on the switch. Give diagram of switch showing what each terminal on switch is for.—E. F. Chaskel, Chaskel Auto Company, Florence, Ind.

A diagram of the lighting and ignition system of the Essex car is shown in Fig. 11 with a connection for the spotlight indicated. Note that it will be necessary to have a switch at the spotlight itself or in the circuit, for if this circuit is not broken, the light will burn as soon as the ground connection is made.

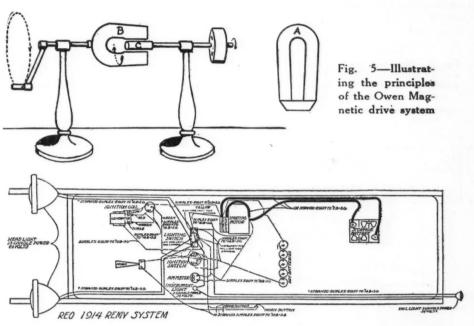


Fig. 6

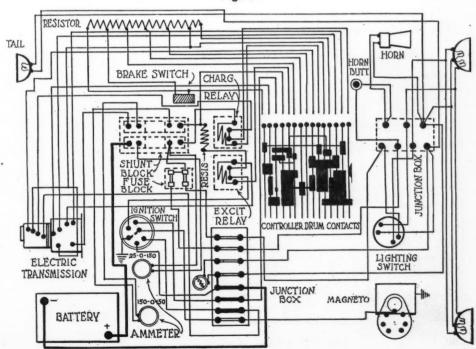


Fig. 7-Wiring diagram of the Entz system as used on the Owen Magnetic

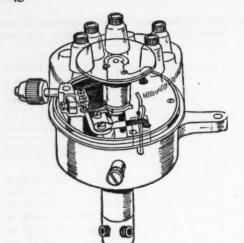


Fig. 8-Distributer head of the Philbrin ignition system



Fig. 9-Showing the principle of the condenser which is exactly like the condition produced by placing a rubber diaphragm

Engines

ESSEX PISTONS PUMPING OIL

Q-What causes an Essex to use too much oil and foul plugs frequently? The engine misses and knocks. Is this due to the use of lightweight aluminoid pistons, so that when the engine is cold oil passes to the combustion chamber before the pistons have heated and expanded sufficiently to stop oil passing?-H. O. Colcord, Little Rock, Ark.

This is probably due to what is known as oil pumping which allows the oil to pass the pistons and get into the combustion chamber. The fouling of the plugs may also be caused by the low grade fuel which perhaps is not properly atomized. Troubles of this kind have been reported to us and the only way this can be overcome is by refitting new pistons and rings.

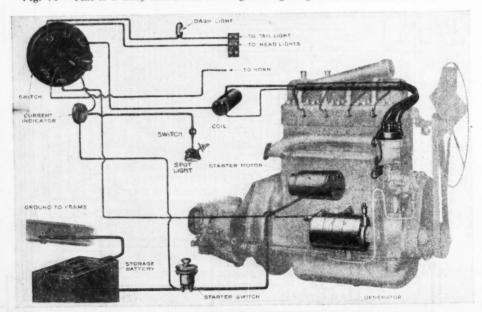
ROTARY ENGINES

Q-What company manufactures rotary engines for motor cars?

2—Are rotary engines very efficient in the way of speed, power and acceleration? 3—How does the steam car generate steam fast enough for the car to make a

in a water pipe HEADLIGHT SIDE LIGHT AUTOMATIC TAIL LIGHT DASH LIGHT YELLOW GENERATOR. YELLOW AMMETER FOOT PEDAL SWITCH HORN PUSH BUTTONO SIDE LIGHT

Fig. 10—This is a Gray and Davis starting and lighting as used on an Overland 79



ig. 11-Connections on 1920 Essex showing the Delco starting motor, generator and distributer

long, fast run over pikes?-Roy McKinney, San Angelo, Tex.

1-There are no companies manufacturing rotary engines for motor cars. A few years ago the Macomber Company manufactured a rotary motor which was installed in the Eagle motor car. A few cars were built but did not prove satisfactory and the company because it was unable to compete in the motor car field ceased to exist.

2-The rotary engine is very efficient in the way of speed, power and acceleration but have a limit on size. There are several prominent European aeroplane companies using rotary engines. The Gnome is probably the best known of the rotary engines and was used very successfully during the recent war.

3-The steam car generates steam in small amounts at a very high pressure and the speed that the car can attain for a long period of time is dependent upon how much steam can be generated by the boiler. A new steam car was recently described in detail in Motor Age.

MAXWELL KNOCKS

Q—There is a very bad pound in the engine of a 1917 Maxwell 25 when run on a hard pull or a steep grade, also when idling down hill. The noise is more noticeable at low speeds. The main and conable at low speeds. The main and connecting rod bearings have been tightened. The engine has always had plenty of oil.

-W. O Wilcox, Rosemount, Minn.

This knock may be caused by carbon deposit in the engine, overheating, loose wrist pin, broken piston ring, or spark advanced too far. It would be advisable to clean out the carbon, grind the valves, and go over the ignition system carefully. If conditions are not bettered it is probably a loose wrist pin or broken

HORSEPOWER FORMULA

Q-Publish the S.A.E. horsepower formula.-Joseph Ruzicka, Chicago.

Ordinarily a formula is used and is called the N. A. C. C. formula, being identical with the S.A.E. formula of previous days. This is:

D2 x N x .4

in which D is the diameter of the cylinder in inches, N the number of cylinders and the fraction is a determined constant. This is the formula generally used in determining approximate horsepower of motor car engines.

NATIONAL VALVE TIMING

Q—On page 50, January 1 issue, you published a valve timing diagram of the 1914 National. Explain in figures how this timing is worked out.

2—If I have a wheel 48 in. in circumference, how would I mark off 7 degs.?

3—Is there a formula for calculating the different sizes of circles?

4-Where could one obtain a book covering the calculation of percentages, frac-, weights and measures?—Herbert H. Shields, New York.

1-The intake opens at 7 deg. after upper dead center and closes at 45 deg. after upper dead center. The exhaust opens 50 deg. before bottom dead center and closes 7 deg. after top dead center.

2-You can divide the circumference in any desired number of parts by measuring it with a tape measure and dividing the number obtained by 360 which will give you the distance on the circumference for one deg. You can then multiply by whatever number of deg. is desired and get a fairly accurate result. In your case 7 deg. will be slightly less than 15 of an in. measured on the circumference. D2x3.1416

3-Yes, this formula is -D is 2.5 the diameter.

4-We would suggest that you write A. C. McClurg Co., Chicago, or McGraw Hill Pub. Co., New York, and they will be able to furnish you with a list of books covering the subject.

LIBERTY ENGINE

Q-Give the bore and stroke of the Liberty engine.-John R. Peters, Peru, Ind.

The bore and stroke of the Liberty engine is 5 by 7 in.

TWO TYPES OF LIBERTY ENGINE

Q-What is the difference between the high and low compression Liberty engine? 2—What was the name of the engine used in the La Pere plane that flew from New York to Washington at a speed averaging 175 m.p.h.?—Alex R Wilson, Chicago, Ill.

1-There were two types of Liberty engines developed, one of the high compression type and the other whose compression was slightly lower. In the high compression engine a ratio of 5.33 to 1 is used which gives a compression pressure of about 78.7 pounds per sq. in. and with the low compression engine whose compression ratio is 4.72 to 1 the compression pressure is 69.4 pounds per sq. in.

2-This was a Liberty 400 h.p.

d

n

n rs

n-

ly

w

n-

H

D-

af-

ns

nd

SPEED AND POWER OF PEERLESS

Q-What is the speed of the Peerless, model 56. About what power should this car develop at 2800 r.p.m.?-Francis Bauer, Mitchell, S. D.

1-The Peerless model 56 will attain a maximum speed of about 75 m.p.h. The engine develops 80 hp. at 2800 r.p.m.

BORING FORD VALVE OPENING

Q-Can the Ford valve opening be bored

out to an inch and one-half without in-jury to the cylinder block?

2—Where can a manifold for a Ford block and an inch and one-quarter carbube obtained?—Sidney L. Freers, Terre Haute, Ind.

1—It is not possible.

2-The makers of the Zenith, Rayfield and many other carbureters have special manifolds for Ford cars.

OAKLAND SMOKES

Q-A 1918 Oakland 34-B smokes badly. Weuld Superior rings, one on each piston, stop this?

2-Would you recommend Leak-Proof rings and how many to each piston?
3—Give bore and stroke of this model.

Theo. S. Dahl, Volga, S. D.

1-This smoking condition may be caused by an excess of oil or poor carbureter adjustment. We cannot recommend any particular piston ring but undoubtedly the installation of new piston rings would help very much if the oil is getting by the pistons.

2-See 1.

3-The Oakland engine is 218 by 434 in, bore and stroke.

COMPRESSION PRESSURE

Q-How many pounds compression should the average cylinder have?—Her-ington Motor Co., Herington, Kan.

Compression pressure has been reduced somewhat due to the condition of present day fuel and at the present time

the pressure of from 60 to 65 lb. is in general use in automobile engines. The tractor engines using the lower grades of fuel chiefly kerosene are using a compression pressure of from 55 to 60 lb.

CRANKSHAFT GRINDERS

-Publish the names and addresses of companies that manufacture crankshaft grinders.—Harry H Dunham, New Salem,

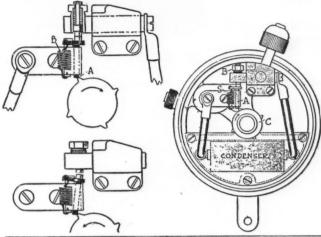


Fig. 12-The make and break contact of the Philbrin system are shown to the left. Should the cam be rotated in the wrong direction below to the left the trigger is kicked out of the way

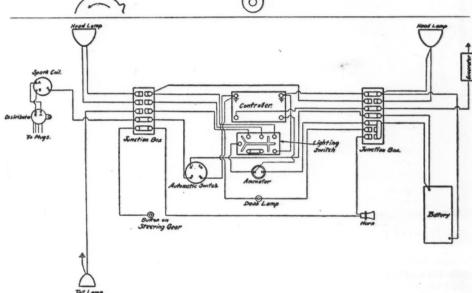


Fig. 13-Moline Knight 40 wiring diagram with Auto-Lite starting and Wagner lighting system

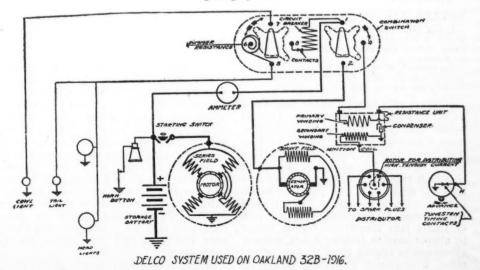


Fig. 14

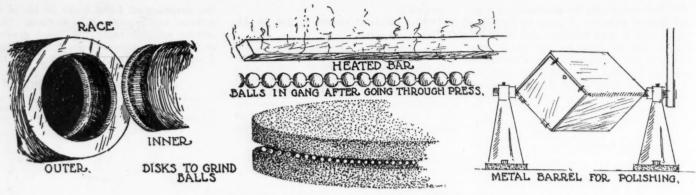


Fig. 15-The process of manufacturing ball bearings

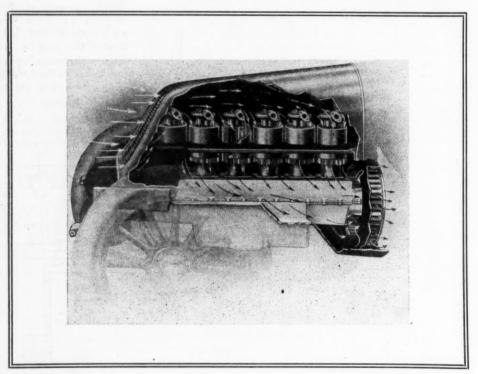


Fig. 16-The path of the air currents through the Franklin engine is shown above

Any one of the following can furnish you with crankshaft grinders: Cincinnati Grinder Co., Cincinnati, O.; Webster & Perks Tool Co., Springfield, O.; Peters Engineering Co., Philadelphia, Pa.; Modern Tool Co., Erie, Pa.

ROTARY ENGINE FOR RACING CARS

Q—If practical to install, for racing purposes, a 5-cylinder Gnome aviation engine in a motor car chassis, publish diagram of method.

2—Publish diagram of the Franklin aircooled engine, also power curve.—Robert N. Adams, Avilla, Ind.

1—We hardly know whether this would be a practical application or not. It seems that with the rapidly revolving mass a gyroscopic force would be set up that would tend to keep the car moving in the forward line of travel. Traveling at a high rate of speed as an engine in a race car must do, a rotary engine would develop such a resistance force toward any attempt at deviation from the line of travel that disastrous results would be almost sure to follow. Again, when a gyroscope is shifted from its axis of rotation a rotational movement is set up which would cause a pulsating effect

that would make management rather difficult.

2—A diagram of the Franklin engine showing the path of the air cooling currents is shown in Fig. 16. A power curve of this engine is not available.

PULLMAN VALVE TIMING

Q-Publish the flywheel valve timing, in inches, as used on the 1917 Pullman, 4-24.—J. M. Phares, Marshall, Okla.

We have no information on the flywheel timing in inches but the engine may be timed as follows: Get 1 and 4 pistons on dead center, 1 and 4 up on flywheel on engine—noted by removing plug in flywheel housing. This can be accomplished by turning the engine over by hand, applying the starter crank and proceeding slowly, until line (prick punched) with 1 and 4 stamped is in line with punch marks on outer edge of plug hole. Let engine remain in position.

Take cam plate and revolve the camshaft gear until No. 7 cam (counted from gear and 1-2-3-etc.) just raises No. 7 valve tappet.

At this point a medium should be maintained, that is, No. 7 tappet raises and

No. 8 begins to seat. It will be noted that the cam plate has two prick punch marks at the center of the outer opening where the cam gear revolves and the cam gear has two corresponding marks. These should be held stationary in respect to one another, while the chain is being assembled. Following assemble the magneto gear box and tighten the chain.

To be sure that the timing is correct, apply a wrench to the crankshaft ratchet nut and move the crankshoft a slight distance, noting the action of cams Nos. 7 and 8 as described before, Hence, if 1 and 4 on the flywheel remain in normal position, the cam plate is timed correctly.

HOLLOW CRANKSHAFT OILING

Q—Name truck concerns, other than the Packard, using the hollow crankshaft oiling system.—W. H. Hughes, Magdalena, N. M.

It is probably safe to assume that all trucks of three tons and over have a force feed oiling system with a hollow crankshaft.

DRILLING CONNECTING RODS

Q—Would it be advisable to drill the connecting rods with 4½-in. holes and piston skirt with ½-in. holes to equal that of connecting rods to decrease the weight in a Model 41 Jackson equipped with a Northway engine with a bore and stroke of 4½ by 5½ in. What results would be obtained? Would it be necessary to lighten the flywheel accordingly?—Z. W. Blackmer, Bellevue Garage Co., Bellevue, Mich.

We do not advise drilling the pistons and connecting rods because we believe it will weaken them. They are designed for certain definite strength and we are afraid that drilling them to reduce the weight might result in broken pistons and connecting rods. If you desire to speed up your engine it would be well to install light connecting rods and pistons and perhaps a new camshaft that would give a higher lift.

BALL BEARING MANUFACTURING

Q—How are steel ball bearings made and polished?—Schardin, Nelson & Neale. Lake Benton, Minnesota.

The process of making balls and ball bearings varies, to a certain degree, with the number of makers, each having his own methods and special machinery, which, as a rule, is more or less complicated and yet wonderful in its functions. Therefore it will only be possi-

1e

s.

e-

is

le

1e

t

ft

ft

of

in

is

ll

al he ed

ns

it

OT

re

he

ns

to

ell

is-

at

G

de

le.

all

ee.

ng

ry,

m-

nc-

ble to give an idea of how the work is performed, yet it will serve to give a good idea of what is necessary to make these important parts of modern automotive machinery.

We will, for the sake of illustration, take the annular bearing, which is so commonly used not only in transmissions but in wheels in many cars, although it must be confessed that roller bearings are taking the place of the annular in these parts.

The outer and inner races of a bearing are as a rule turned out of steel tubing that is made close to the right size to begin with; at least the outside diameter is nearly correct, but sufficiently oversize to permit of initial and final grinding to exact size.

Automatic machinery handles the work with but little attention more than to see that the machine is supplied with the long piece of tubing. Automatically the machine cuts the race the right size and at the same time starts the groove for the balls. As the work is finished the race is dropped into a receptacle and so the work goes on. The inner race is made in much the same way, except that the groove for the balls is on the outside instead of the inside.

These races are then placed into a machine that grinds them to a fairly close fit. After this operation the races are placed in the hardening oven and are brought up to a certain degree of hardening, after which they are again ground to an exact size.

Fig. 15 shows a section of the steel tube with the race about cut and ready for the grinding process.

Perhaps more interest centers in the making of the balls, for this is something of a delicate process and must bring out the little weight carriers to an exact size, otherwise if one happens to be a minute fraction larger than its neighbor it will have to shoulder practically all the load.

Long bars of soft steel are kept in a furnace and heated to a certain degree. It is of course assumed that a certain size is being used for a given size of ball, and always the size is run through in batches. There happens, however, to be a comparatively big variation in the balls when they come out and this is taken care of by the varying sizes and oversizes that are required in all work.

When the bar of steel is at a certain heat it is inserted between the dies of a big punch press and when the hammer is dropped by the attendant the steel bar is instantly converted into a string of rough balls, hanging together by a thin piece of metal. A blow separates the balls. Heavy dies are used to form the balls in their initial state of shapeliness. Some idea of how the balls come from the dies may be gathered by observing Fig. 15.

Now the balls are placed between immense disks of carborundum for initial grinding, as shown in Fig. 15. These disks are set in a parallel position and are rotated in opposite directions. In addition there is above the machine a

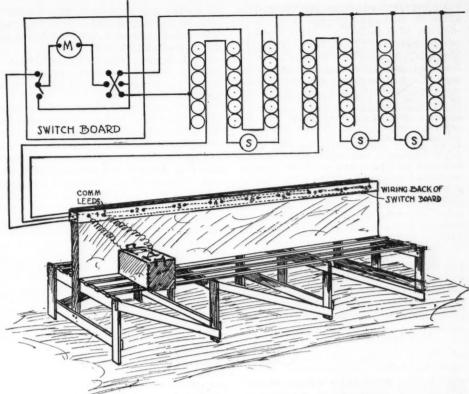


Fig. 17-Test bench designed by Motor Age reader, H. M. Parkhurst, Rockford, Ill.

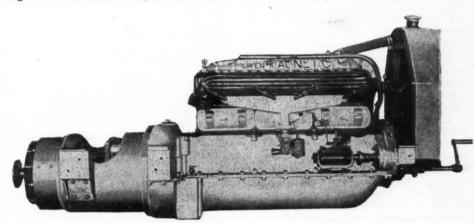


Fig. 18—The unit power plant of the Owen-Magnet. Instead of the clutch and transmission there is used a motor and a generator

micrometer that operates automatically and prevents the machine from grinding the balls beyond a predetermined size.

While the grinding machine smoothens the balls nicely the work is not fine enough for the use to which the little globes are put and they must now be put into a barrel-like affair that is set at something of an angle and is rotated by an electric motor at a speed around 75 r.p.m. These barrels are of metal and have to be renewed frequently owing to the wearing effect of the rotation of the balls.

In the barrel with the balls will be placed bits of leather, vici, etc., to aid in the smoothening process.

Here the balls have completed their first stage and are hardened. But this warps them to some degree and they must again find their place in another barrel, in which also is a slight abrasive to assist on the cutting and polishing. After they have gone through

this process they come out perfectly round, hard and highly polished. But there is still some variation in size and they have to be run through a device that permits the smaller balls to drop into one place and the next size into another, and so on until all have been sorted. This process is similar to that employed in sifting out the various sizes of crushed stone or anthracite coal, yet it requires special novel and delicately measured apparatus to accomplish the work.

The balls are now put in between the outer and inner race and held in place by a retainer and the work is completed.

Thrust bearings are made in a similar manner, the disks being cut off, ground, grooved, hardened, ground and polished to a size required. There are, it will be remembered, many sizes and kinds of bearngs, but in all the manufacturing process the general rule applied is the similar.

REMOVING PISTONS OF HUDSON SUPER SIX

Q-When an exhaust valve looks red, or like it has been hot, does it indicate a leaky valve?

2—Instruct how to remove No. 1 piston out of a Hudson Super Six car without removing cylinder block. In an attempt to remove the piston the balances and studs were taken out and crankshaft placed in several positions, but to no avail.

3—The engine of a Hudson Super Six car runs quietly when idle, or at a speed of 30 m.p.h., but over this and up to 45 m.p.h. makes a terrible noise like all bearings were loose and pounding at once. Bearings seem tight. What causes this?

Bearings seem tight. What causes this?

4—On a Saxon Six the connecting rods and main bearings were taken up, but when the engine is running 15 m.p.h and over it pounds very badly. What is the cause of this trouble?—Philip J. Leonard, Topeka, Kans.

1—A valve might be seating tightly and yet under some circumstances take on a color as described; yet it may be assumed that your diagnosis is correct. Running a car with too rich a mixture or a late spark, or both, will have this effect

on a valve and in a short time the valve will be so warped that it will not seat. This effect has also been produced by the use of certain kinds of fuel.

2—It is not possible to remove the number 1 piston without removing the block. This can be accomplished with numbers 3 and 4 only.

3—We are inclined to think your trouble comes from loose engine bolts in the arms holding the base to the frame of the car. This is not an unusual case and in many instances much expense has come in fussing around everything except the right place. Excessive vibration may also be occasioned by a crankshaft that is not true and that will not whip under slow rotation, whereas it will simply raise the engine rapidly under high speeds. It is suggested you first look to the engine supports and then, if the trouble is not remedied, see if the crankshaft is true.

4—The answer regarding the Hudson applies in this case, except that with the Saxon the case is an aggravated one.

cause the factory deemed the high speed adjustment sufficient to take care of all ordinary conditions.

IMPROVING CARBURETION

Q—On my 1912 Chalmers 36, 4—4½x5½, a Rayfield single-jet carbureter is fitted, the waterjacket connects up with a ¼-in. pipe. The water seldom boils in hot weather and only gets warm in cold weather. Would you advise connecting the waterjacket of carbureter so that the hot exhaust gases would pass through instead of the water?

2—The fan has six blades; would it be well to take out four of them in winter?
3—Should there be any spark at the breaker point of a Bosch magneto?—G.
W. Rinehart, Lynchburg, Va.

1—This could be done but we do not think this will give the desired result. With the condition of present day fuel as it is the best thing to do is to purchase a new carbureter, shorten the manifold and install a hot spot manifold if possible.

2—We do not advise removing any of the blades of the fan as there are many other ways of regulating the engine cooling system for cold weather which would not interfere with the present design.

3—If there is a strong spark at the breaker points it indicates a punctured condenser.

WEBBER CARBURETER ADJUSTMENT

Q-Illustrate and give adjustment of the Webber carbureter.-A. Brown, Omaha, Neb.

This is an automatic carbureter and there are only minor adjustments provided for. For idling turn A right for lean and left for richer mixture. The adjustment is very sensitive and the screw should be moved one notch at a time If it is a new engine or the gasoline has been shut off completely start engine with 9 open one-half turn. The adjustment for maximum power is not so sensitive. The air can be adjusted by moving air valve spring C turning it to the right for more tension and to the left for less tension as required. The carbureter is shown in Fig. 22.

HOLLEY CARBURETER

Q—Publish a diagram of the Holley kerosene carbureter as used on the 16-30 and 12-20 Twin City tractor.—C. B. Burke, Lethbridge, Alta.

Sectional view of the Holley carbureter is shown in Fig. 19.

CADILLAC CARBURETER

Q-Publish diagram showing the 1919 Cadillac 57 carbureter.—R. F. Dickson. Kansas City, Mo.

Carbureter used on the 1918-1919 Cadillac 57 is shown in Fig. 23.

ADJUSTMENT OF PIERCE-ARROW TRUCK CARBURETER

Q—Instruct and illustrate how to adjust carbureter and float level on a 1917 Pierce-Arrow truck.—J. D. Milne, Williamsbridge, N. Y.

The supply of gasoline is controlled by a needle valve "4" at the bottom of the carbureter. The carbureter is of the automatic float type with adjustable jet area. The auxiliary air is admitted through carefully calibrated reed valves (1). The main air is drawn in through

Carburetion

ADJUSTING RAYFIELD CARBURETER

Q-What causes spitting in a Rayfield carbureter on a 1920 Mitchell E-540, and what adjustments should be made to avoid this triuble?—Leslie D. Lee, Water Valley. Miss.

This is undoubtedly a case of too lean a mixture. All Rayfield carbureters are adjusted for more gasoline by turning the needle valves to the right. There are three adjustments on this carbureter, although two of them only serve to increase or decrease the density of the mixture. The low speed adjustment should be set first. To do this be sure that the engine has run sufficiently long to thoroughly heat all parts. Turn the spark and shut the throttle down so the engine idles nicely. The low speed adjustment should be turned until the engine slows down perceptibly, and until the exhaust fumes lose that heavy pungent odor char-

acteristic of gasoline burned with an insufficient amount of air. Then turn the low speed adjustment to the right until the engine speeds up slightly. If at this setting the engine does not turn over slow enough, with the gasoline and spark levers set at their reduced position, use a small screwdriver, and turn the screw A to the left, which will allow the butterfly valve to close tighter.

Now advance the spark about twothirds of the way. Then grasp the throttle connection to the carbureter and open the throttle valve very suddenly. If the engine sputters and coughs as it accelerates then it is a sign that the high speed nozzle is under supplied. Turn the screw to the right, which will increase the amount of fuel fed to this nozzle. This screw is just inside the air intake opening. It is possible that you will find this screw soldered tight be-

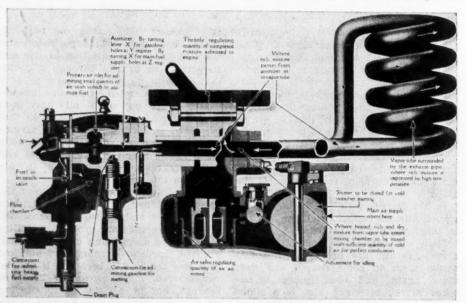


Fig. 19-The Holley all fuel carbureter

pipe (6), Fig. 20, attached by means of a hood to muffler pipe. In the side of the float chamber, a small glass window (7) is located for indicating the level of the fuel. See Fig. 20.

A cold air regulator (5), Fig. 20, is located at the rear of the carbureter. This permits of regulating the temperature of the air going into the carbureter. In warm weather the pointer on the regulator should be set over to read "open" and in cold weather the pointer should be set to read "closed." In the same way intermediate points can be maintained.

There is also a hot water jacket (3) around the mixing chamber. The pipe from the carbureter to outlet water pine has a cock in it. In hot weather this may be closed partly or entirely, but must be open in cold weather.

Back off the needle valve (4) until the engine idles nicely and backfires when the throttle is opened. This will indicate a lean mixture. Then turn the valve just a little as to richen the mixture slightly. This will give you a satisfactory adjustment at both low and high ally high finish is desired complete the finish with one coat of auto finishing varnish. When the surface is in bad condition and the paint has chipped or cracked, remove all loose particles and prime such spots with lead and oil primer, composed of lead in oil thinned with turnentine and a little Japan drier. Allow to dry eight hours and sand paper again to thoroughly even up the surface, apply one or two brush coats of the filler and surfacer eight hours apart sandpapering each coat with fine sandpaper. Complete the job as directed above. It is well, however, to remember that in order to obtain good results it is necessary that this painting job be done in a place that is as nearly dust proof as possible and a place where a fairly uniform temperature can be maintained.

Miscellaneous

THOMAS FLYER-HUPMOBILE-ESSEX

Q-During what year was the Thomas manufactured and by whom?

2—Was the Thomas Flyer a foreign car and what was the price of the 7-passenger model? How many cylinders did it have and what was its brake horsepower? Was it capable of high speed?

3-Under satisfactory conditions what speed can be expected of the Hupmobile? Of the Essex?

4—Does the Hupmobile hold any records endurance, speed, economy, power, etc.?

etc.?
5—Why is the Hupmobile called the "Comfort Car" and is it according to your knowledge a good car?—Herman Meyers, East Moline, Ill.

1-The Thomas Flyer was manufactured by the E. R. Thomas Motor Company, Buffalo, N. Y.

2-The model you refer to is undoubtedly the 6-40, having a six-cylinder engine with bore and stroke 4.25 by 5.5. in. giving an N. A. C. C. horsepower of 43.8 and a piston displacement of 468 cu. in. We do not know the maximum power development of this car but if memory serves right these cars had capable speeds.

3-50 to 55 m.p.h. might be termed the maximum speed of the Hupmobile car. Some of the models might go faster than this as others in the hands of less experienced drivers not as fast. The writer has driven an Essex car at the rate of 67 m.p.h. and it seemed that a mile or two more was possible.

4-This we do not know.

0

of

ie

et

28

5-This is a question we feel should be answered by asking another question. Why do other car manufacturers assign characteristic names to their products? The Packard Company says of their product, "Ask The Man Who Owns One." The Jackson Company calls their car, "The Velvet Six." If you will look through the advertising pages of any motor car journal you will note that practically every car maker uses some by-line. We see no reason why the Hupmobile car should be alluded to as anything but a successful car.

PAINTING THE CAR

Q-Describe best method of removing paint from car.-H. S. Bringgold, West Concord, Minn.

The expert auto and carriage painter can obtain a real "factory finish" but there are many of us who cannot spare the amount necessary for this work, so

it is well to know a little something about doing the work ourselves. We do not believe that you want to remove all of the paint on your car as this requires considerable time and we believe that you can obtain just as good results without removing it all from the car. If the surface is in good condition and it is desired merely to freshen up the colors, clean off all of the dust, dirt and grease with benzine and turpentine, sand paper lightly to cut the gloss, then apply one or two coats of a good auto finishing varnish. If it is desired merely to change the color in keeping with your own ideas, first thoroughly clean off all foreign matter with sand paper as directed above. Then apply two coats of auto enamel of the desired color. Where an exception-

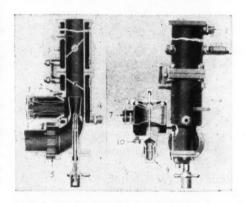


Fig. 20-Carbureter used 1917 Pierce Arrow truck

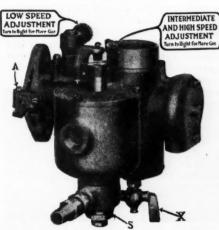


Fig. 21—Rayfield carbureter as used on a Fig. 23—Carbureter as used on the 1919 1920 Mitchell

ANTI-FREEZING MIXTURES

Q-In mixing alcohol with the water in the radiator it is very hard to get proper proportion, and if too much is put in water boils. I have been using keroin water boils. I have been using kero-sene and find that it works O. K. Would you advise its use, or will it hurt the At what temperature does it freeze. -D. A. M. Gordon, Irvington, N. Y.

1-It is not very difficult to get the proper proportions of alcohol and water in your radiator as there are definite percentages given, which will prevent freezing at certain temperatures. table of this nature was published in Nov. 6 issue of Motor Age. After the proportions have been obtained in spite of the fact that all of the joints may be tight there will be a certain amount of evaporation.

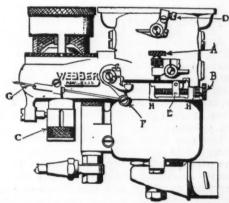
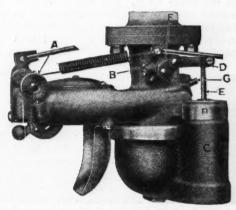
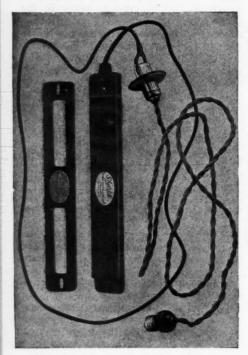


Fig. 22-The positions of adjustment on the Webber carbureter



Cadillac model 57

The Accessory Orner New Fitments for the Car



Sharpe electric radiator heater

Anco Shortproof Timer

Automobile accessory dealers are finding much of interest in the recently announced Anco Shortproof Timer, which entirely eliminates the roller and fibrering principle common to the earlier types of timer, and provides instead a steel brush with wiping instead of rolling contact.

The new timer is said to make an immediately apparent improvement in the performance of any Ford engine, by vastly improving the ignition and exceptional durability and long life is also claimed for it.

The contacts, which are of heavy steel, are separately insulated and anchored to the timer itself. The wiping contact makes the timer self-cleaning and at the same time delivers a strong positive spark at all speeds and under all load conditions.

The Anco Timer is attractively finished in brush brass and is an exact replacement for the regular Ford timer. It is manufactured by The Anderson Co. of South Bend, Ind., and retails at \$2 in individual boxes, \$2.25 for the tractor.

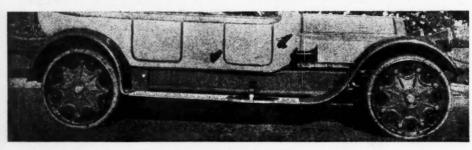
Sylphon Regulator

The Sylphon regulator is a device for regulating the temperature of the cooling system of an engine so that a temperature will be maintained that will give the most efficient operation. All cooling systems are designed to prevent temperature of the engine from rising above the point of maximum efficiency under the most strenuous conditions in the very hottest weather. There is such



Anco shortproof timer

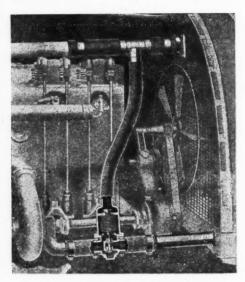
a thing as over-cooling and without thermo-static control much fuel is wasted on account of incomplete combustion and condensation on the cylinder walls. The Sylphon regulator, manufactured by The Fulton Co., Knoxville, Tenn., is self-contained, automatic, simple, durable and efficient, and is at present part of the equipment of some of our leading American pleasure cars and tractors.



No-D-Lay elastically suspended wheels which absorb shock by reason of the rubber balls between the disk and the outer rim

Sharpe Electric Heater

The Sharpe electric heater, manufactured by the Sharpe Electric Appliance Company, Dime Bank Bldg., Detroit, is an electric heating unit that is secured to the bottom of the radiator and attached to the electric lighting cord. The heater is of the permanent type, being fastened securely by long bolts to the bottom of the radiator. A cord connects the heater to the lamp attachment plug, which is fitted to the dashboard of the car. From this place it is possible to plug in on any convenient lamp socket to the dashboard plug. The current consumed by this unit is not more than two amperes.

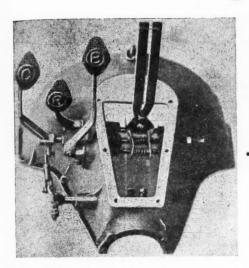


Sylphon regulator for maintaining the heat of the engine which gives the most efficient operation

No-D-Lay Elastically Suspended Wheels

The No-D-Lay wheel is a new development in wheel construction, which it is claimed has great resiliency and on which hard tires are to be used. The reason the solid rubber tire is not successful is that its resiliency is limited to a very small portion of rubber that is in contact with the road bed and when heavily loaded the rubber reaches the limit of its compressive elasticity. This wheel is composed of three parts, steel rim and two cup disks, the latter corresponding to the spokes in the ordinary wheel, physical contact between the cup disks and the steel rim being accomplished by a suitable number of rubber balls as shown in the illustration. The wheel is manufactured by Ellis Resilient Wheel Corp., Seattle, Wash.

Service Equipment Time Savers of the Shop



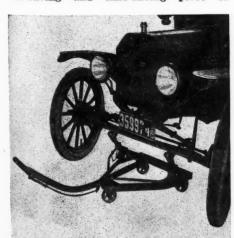
Roberge Ford transmission band spring compressor

Roberge Ford Transmission Band Spring Compressor

The Roberge transmission spring compressor is used when replacing transmission bands. It compresses all three springs at the same time and leaves a space of one inch on each side of the springs, allowing plenty of room for the bands to slip in place. This tool is made from the very best grade of material and ought to last a life time with ordinary care. It is manufactured by Roberge & Sons Mfg. Co., Dallas, Texas, and sells for \$2.

Bruhn's Double Eccentric Adjustable Jack

This is something entirely new in the line of automobile jacks, which is a labor-saving and time-saving piece of



at

en

is

el ery

Bruhns double eccentric adjustable jack

equipment. It is a double eccentric jack that will lift twice with one pull of the lever. Cars can be moved sideways, cut in at right angles and turned completely around within their own length. The jack, which can be used on front or rear of cars, is made of high-grade steel castings with a sliding telescope, which makes the jack adjustable. The frame is of heavy angle iron with extra heavy roller castings. The jack is manufactured by Bruhn's Mfg. Co., Hammond, Ind.

Badger Portable Tire Rack

Many dealers are keeping their tires piled up in a jumbled heap. The tires gather dust, wrappers become torn and the tires look old before they are sold. No wonder the customer is not favorably impressed. Many times a sale is lost and when the customer does order the salesman has to spend time rummaging through the pile to find the particular brand and size of tire that is wanted.

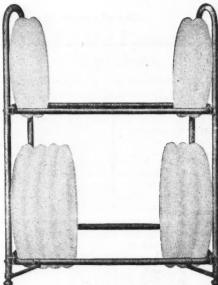
As a solution to this difficulty the Badger Manufacturing Corp. has built a portable steel rack which will hold approximately 25 different sized tires in two neat rows, yet occupies less floor space than the tires themselves would take, if piled on the floor. Additional racks can be used to accommodate larger stocks. A descriptive circular of the rack shown in the illustration can be obtained from the Badger Manufacturing Corp., Milwaukee, Wis.



Allen Bradley battery discharge test set

Battery Discharge Test Set

The Allen Bradley storage battery discharge test set is designed to detect weak or dead cells in ignition, starting and lighting batteries by the high rate discharge method. Any number of cells, from one to twelve inclusive, may be tested in series. A resistor of the standard Allen Bradley graphite compression type is used. The resistance is secured by the imperfect contact of a column of graphite disks inclosed in a steel tube and is varied by applying pressure on the column by means of a hand wheel at one end. The whole of the resistance unit is in the circuit at all times so that a high wattage capacity can be concentrated in remarkably small space. Made by Allen Bradley Co., Milwaukee, Wis.



Badger portable tire rack

Silent Salesman Accessory Case

In purchasing one article the customer frequently sees other articles and buys them. The case acts as a reminder of articles needed which the customer might never think of if he didn't see them. Your floor space is valuable. This display case cuts down to about onehalf space you would require to display an equal amount of goods on shelves. It is a silent salesman, on the job all the time. One of the features of this case is its indexing system, which serves as an automatic clerk. By numbering the backs of the doors and hanging up an index in a convenient location any one, no matter how inexperienced in your stock, by reference to the index can locate quickly any article. The case shown in the illustration is manufactured by the Detroit Show Case Co., Detroit.



Onan Testing Device

The Onan Testing Device was described in the March 18 issue of Moros Age and due to a typographical error the selling price was given as \$5.00 instead of \$75.00.

Passenger Car Serial Numbers

Motor Age Maintenance Data Sheet No. 92

One of a series of weekly pages of information valuable to service men and dealers—save this page

REGAI	.				SCRIP	PS-BOOTH	(Cont	inned)	_
Year	Model	Cyls.	Price	Serial Numbers	Year		Cyls.		Serial Numbers
1912	N L	4	\$900 1000	2201-5100 2101-3000					Number plate on heel board, right hand seat
1913	H	4	1400	301-450		6 - 39 $6 - 40$	6		9001-11599 9002-11599
1313	T C	4	$\begin{array}{c} 950 \\ 1250 \end{array}$	5101-7700 1-450		6-41	6	1985	11432-11599
1914	H T C	4	$\frac{1400}{1125}$	451-600 7701-9000		6-42	6	1985	11434-11599 Number plate on seat board un- der front seat cushion
1915	D	4	$\frac{1350}{1085}$	453-600 10171-11254	1919	G	4	1065	der front seat cushion 1801-3000
1916	E	4	650 985	3074-3525 11255-11550		6-39	6	1295	11600 Number plate on right seat heel
1917	F-8	8	1200 695	244-550 24382 up		6-40	6	1295	board 11600-18759
Discont		4	030	Number on left hand frame mem-		6-41	6	1985	11600-12432 11600-16419
				ber at spring.		6-42 A-41	6	2175	16420 up
REO					1920	A-42 B-39	6	1995	18410 up 20001 up
Year 1912	Model R-5, ST-5	Cyls.	Price \$1055	Serial Numbers 36001-42000					Number plate on seat board un- der front seat cushion
1913	R-5, ST	4	1095	42001-52000	SENE	T.A.			
1914 1915	R-5, S-5, R-5, S-5,	D 4 L 4	$\frac{1175}{1050}$	52001-64000 64001-76000	Year	Model	Cyls.	Price	Serial Numbers
1916	M R-5, S-5	6	$\frac{1385}{875}$	101-2100 76001-96000	1917 1918	A D)	4 \$73	5-850	500-1000 1000-2000
1917	M, N R-5, S-5	6	$\frac{1250}{875}$	2101-10200 96001 up	1919 1920	H }	4	1185	2001 up
1918	M, N M	6	1150 1385	10201 up 20100 up	1020			1100	Number plate on 1917 models on dash under hood. On 1918 and
DOLLE	ED								1919 models on dash under hood and on left frame rail in front of
ROAM Year	EK Model	Cyls	Price	Serial Numbers					radiator
1916 1917	All	-6		10500-13500 13501-15750	SIMP				
1918		& 6	*******	13751-16970 16971 up	Year 1913	Model 30		Price \$4850]	Serial Numbers
1920	All		*******	10011 up		50 90	4	5600 6450	1040-1310
ROSS					1914	A D	4		1311-1498
Year	Model		Price	Serial Numbers	1915 1916	38	4	4100)	1499-2079
1916 1917	A C	8	\$1350 1550	1003-1495 1496-1721	1010	50 46	4	4600 5000	2080-2253
Discon					1917	5	6	6000	2254-2357
SAXO	V				Discon				Number on dash plate
Year	Model		Price	Serial Numbers	SINGI Year		Curlo	Duiss	Carial Warraham
1915	A-2	4	\$395 395	100-9740 101-519	1915	Model	6	Price	
	B-2	4	$\frac{395}{395}$	10102 - 15082 $342 - 735$	1916	*******	6	*******	7500-7600 7601-7784
1915-16	S	6	785 395	101-4843 101-9574	1917	********	6		
1010-10	S-2 S-2-R	6	835 835	5101-19199 101-2100	1918	*******	6		77903-77904 18905-18999
1917	B-5-R B-6-R	4	495 495	9601-X2054 3 X1-X128	1919 1920	*******	6 12	*******	19000-19940 20101 up
1017 10	B-7-R	4	495	X790-X1222				*******	Number on front spring front
1917-18	S-4-R	6	1045 995	19201-X40602 2101-X5192					horn bracket.
1918	S-4-S Y-18-R	6	$\frac{1350}{1195}$	30700-X42973 101	SKEL		~ -		
1919	Y-18-T Y-18-T	6 6	$\frac{1195}{1295}$	1201 7650 up	Year 1920	Model 35	Cyls.	Price \$1245	Serial Numbers 500 up
1920	Y-18-R	6	1295	1031 up	STEA N	DARD			
	DE				Year	Model	Cyls.	Price	Serial Numbers
Year	Model	Cyls	Price	Serial Numbers	1916	E		\$1850	175-519
1918 1919	P A-P)	6	\$1695 1745	5100-5300 5301-5700	1917 1918	$_{ m G}^{ m F}$	8 8	2450 2750	C100-599 $600-1099$
1920	B-P C-P			5701 up	1919	H	8	2750 3000	1100-1599
1020	0-1	****	*******	Number on left side of cowl un- der hood	1920	*******	0	3000	1600 up Number plate on dash; engine numbers on crankcase
OCHE	no naom				CM A ST	TEV			numbers on crankcase
Year	PS-BOOTI Model		Price	Seria. Numbers	STAN Year	Model	Cyls.	Price	Serial Numbers
1915 1916	C	4	\$775 825	101-3100 3101-7260	1915 1916	720 & 721 725, 726 }	2 2	\$1975 2200	15001-15999 16001-16999
	D	8	1175	101-800	1917	727, 728 { 728 & 730	2	2200	17001-17999
1917	D	8	935 1285	7261-8146 801-1807	1918	735 & 736	2	2800- 3740	18001-18999
1918	e e	4	935 1065	6-800 801-1800	1920	735	2	4275	
	H	8	1285	2-325	Numb	er on chassi	s fram	10	19001-19999

The Automotive Repair Shop Practical Maintenance Hints

Details of a Small Pin or Drill Chuck

The illustration shows the details of a small chuck useful for holding pins, drills, nails, wire, etc., either in conjunction with a handle or for use with the bench or speed lathe.

The feature consists of a round piece of mild steel threaded and turned down to a conical end. A drilled hole corresponding to the size of the parts to be chandled or slightly larger is made through the center. The part is then saw slotted crosswise making the points more or less flexible.

A knurled sleeve drilled and tapped to screw over the piece already made, is the means of tightening the jaws about the parts to be held.

A file handle can be fitted by cutting the extreme end down in size to fit the handle making the tool a sort of hand vise, or the end can be machined to the tapering size required for inserting in the lathe head or drill press as desired.

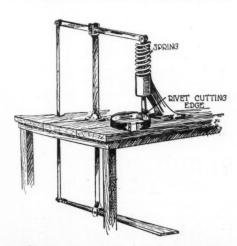
Brake Rivet Cutter

Where many brake bands are relined special equipment is justified. It is a simple matter to make a tool for cutting the rivets away from the old lining and a machine may be purchased for riveting the new lining in place.

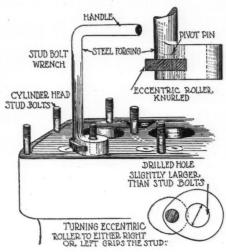
The illustration shows the machine for cutting away the rivets. It consists of a $\frac{5}{8}$ in. rod with a knife-edge on the lower end, the rod sliding in a suitable cross-head. The downward motion of the knife is controlled by pressure on a pedal and the return stroke of the knife is accomplished by the coil spring shown.

ont

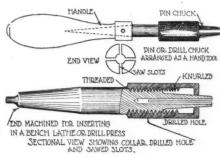
gine



Machine for outting away the old rivets in brake lining



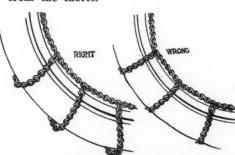
Tool for the removal of stud bolts



Details of a small chuck useful for holding drills, pins, nails, wire, etc.

Applying Non-skid-chains

There are two ways in which a chain can be applied to a rear wheel, one is right and the other is wrong. The chain should be just tight enough so that the peripheral chain will hang loose enough to form a perfect circle. If the chain is tighter than this it will form a series of straight sections. Application in this manner is extremely injurious to the tire and will serve to separate the rubber from the fabric.



The right and wrong way to apply non-skid chain

Tool for the Removal of Stud Bolts

Most mechanics are familiar with the procedure for the removal of stud bolts from engine castings by screwing on two nuts, locking these and unscrewing the bolt by putting the wrench on the lower nut.

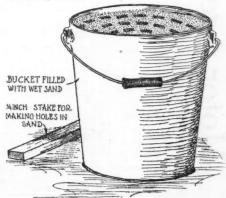
This method is neither as fast or easily done as with a special tool that can be turned rapidly and which will not require the disengaged stud to be clamped in the vise to remove the nuts.

The wrench as shown in the sketch has advantages from the point of speed and will either take out the stud or replace it in the minimum of time.

This wrench consists mainly of an L shaped forging, drilled with an aperture for the end of the stud and fitted with a hard knurled eccentric roller to grip the stud.

Mold for Scrap Lead

Editor Motor Age-To eliminate the expense of buying lead bars for burning posts and connector straps, tear old batteries that are to be junked apart and collect all the lead possible. Even the plates contain a little lead. Melt it all together in a melting ladle by means of a blow torch and skim the dirt off the top. Punch a number of holes in a pail of wet sand and then pour the molten metal in each hole. When cold remove the bars from the same and brush each bar separately with a stiff brush or else a wire brush. These bars will give the same satisfaction as the lead purchased for this purpose. Any other junk lead will not do as it is too hard to work in with the post.-G. R. Vox, Holland Auto and Specialty Co., Holland, Mich.



Making a mold for bars of lead. The old scrap lead from batteries can in this way be utilized again

Motor Age Monthly Guide to Truck Specifications

asob gainest	Ross Ross Ross Ross Ross Ross Ross Ross
əlxA	A THE
Final Drive	THE SERVICE OF THE
фельер (THE
Clutch	OOOODARAA OOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
Carburetor	444444 • 4444 ·
	Scheb. Strom. Zenith Istom. Strom. St
Governor	Pierce Pi
Rectric Lighting	West, Vest,
LaoitingI	A-K.
No. Cyl., Bore and Stroke	minimizer and a second a second and a second and a second and a second and a second a second and
enignA to smaN	
Rear Tires	40x8 40x8 40x8 40x8 40x8 40x8 40x8 38x7 40x8 38x7 40x6 40x6 40x6 40x6 40x6 40x6 40x6 40x6
Front Tires	10 3034
Tons Capacity Chassis Price	12.88.21
minore) snoT	TORREST TORRES
Гэро W рив эшв	Douglas C. Douglas C. Douglas P. Douglas P. Douglas E. Douglas E. Douglas E. Douglas E. Douglas E. Douglas E. Erie. Erie
Steering Gear	
əlxA	GGESSESSESSESSESSESSESSESSESSESSESSESSES
Final Drive	
ЗэвтвэД	wan
Clutch	
Carburetor	SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS
Сочетног	9 9 4 4 4 4 9 8 4 4 4 9 8 4 4 4 9 8 4 4 4 9 8 6 6 7 4 6 8 6 8 6 8 6 8 6 8 6 8 6 8 6 8 6 8 6
Electric Lightin	
noisin3.	1980 1980
No. Cyl. Bore	日
nigard to man	Oomt.
Rear Tires	20000000000000000000000000000000000000
BoriT Juor4	\$
Chassis Price	2, 450 2, 450 2, 450 3, 700 3, 700 3, 700 3, 700 4, 600 6, 600
Tons apacit	SETTINGTON OF THE PROPERTY OF THE STREET OF THE PROPERTY OF TH
Name and Moo	4 & B. 3T. 3800 R.
	A dead Acade

sash Baire	
əlxA	STATE OF STA
ovird land	
Gearset	Her had been
Clutch	B B B B B B B B B B B B B B B B B B B
Carburetor	H H H H H H H H H H H H H H H H H H H
Governor	Street Services
	Hipher Hipher Hipher Hipher Hipher Hipher Hipher Hipper Hi
gaithgid Sitting	Weet, N. E.
Ignition	N. N
Vo. Cyl., Bore and Stroke	A N N N N N N N N N N N N N N N N N N N
ame of Engine	A lo o o o ii ii o o o o o ii ii o o o o
Rear Tires	See
Front Tires	30 8 9 8 9 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9
Tons Capacity Chassis Price	1.1.9888. 2.2.156. 2.2.156. 2.2.156. 2.2.2000. 2.2000. 2.2
	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
і ∍b• М b па эшв	mm. mense en
Steering Gear	GGem. GGem. Warn. A.A.S. A.A.S. A.A.S. A.A.S. A.A.S. B.S.
Axle	HARMAN AND AND AND AND AND AND AND AND AND A
Final Drive	THE STATE OF THE S
Gearset	in be we way woor work work work work work work work
Clutch	
Carburetor	6
Сочегаог	WWW.W.W.W.W.W.W.W.W.W.W.W.W.W.W.W.W.W.
Electric Light	WWW. WWW. WWW. WWW. W. W. W. W. W. W. W.
noitingI	WWNNN
No. Cyl. Bo and Stroke	AND THE PROPERTY OF THE PROPER
Name of Eng	25 GC51515151515151414141444444444444444444
эліТ таэЯ	OOOWWHEELS CONTRACTOR OF THE PROPERTY OF THE P
Front Tire	2000 000 000 000 000 000 000 000 000 00
Chassis Pri	33, 3 900 355, 3 200 355, 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
	できた。
	A A B A B A B A B A B A B A B A B A B A
1	Brooke Brooke Champ Champ Champ Champ Champ Cherrol Collier Collier Collier Connecto Con

Abbrevisions: Engine—Wauk, Waukesha; Cont., Continental; H.S., Hersbell-Spillmer; H.S., Hersbell

Motor Age Monthly Guide to Truck Specifications-Continued

11		MOTORAGE
169D St.		Ross
elzf		HERE BEES SEE SEE SEE SEE SEE SEE SEE SEE S
evird la	Fina	We want We w
198789		Ootta Variation Vari
dotul		A STATE OF THE PROPERTY OF THE
rburetor		HELDER HARMANDOOOO SEED SEED SEED SEED SEED SEED SEED
OVERDOF		Skiron Bar Skiron Skiro
gnitdgid oir		M Mon.
Ignition	1.0	Physical Physics of the Physics of t
Cyl., Bore	· 1-	NA PARA BARREL STORY OF THE PROPERTY OF THE PARA BARREL STORY OF THE PA
me of Engine	14.	44444444444444444444444444444444444444
Rear Tires	1	A WHIN SEE SEE SEE SEE SEE SEE SEE SEE SEE SE
BeriT anor	1	400 40 40 40 40 40 40 40 40 40 40 40 40
Price Price	100	2. 3. 4. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5.
ons Capacity	T 24.20	Concern and the second and the second
leboM bus em	1-0	Obnicia, D. Obnicia, D. Obnicia, D. Obnicia, D. Obnicia, D. Deckard, E. Size C. Packard, E. Size C. Packar
	Oneida, Oneida,	Concide, D. Concide, D. Concide, E. Concide, E. Concide, E. Packard, E. Parice, June Parice, June Parice, June Parice, June Parice, Wash Pierce-Arrow, N. Pierce-Arrow, P. Perce-Arrow, S. Parice, Wash Pierce-Arrow, S. Parice, Wash Pierce-Arrow, S. Parice, P. Ranier, R Reynolds, S. Rowe, CDW Rowe, CDW Rowe, CDW Rowe, CDW Rowe, CDW Rowe, CSW Gowe, FW Gowe, FW Gowe, FW Gowe, HW Gow
Steering Gear	Jacx.	Jacx
əlxA	Clark	Collark Col
Final Drive	in-g.	
Gearset	Fuller Fuller	The property of the property o
Clutch	Fuller Fuller	COOOMAL : BHRHH WAR
Carburetor	Zenith Zenith Zenith	
Сочетног	none Duplx. Duplx.	
Electric Ligh	N. E. Eise.	Eise, Sim Eise, Sim Dacto, Piere
Ignition	N. E. Eise. Eise.	Eise. Eise Eise. Eise Date Date Date Date Date Date Date Dat
No. Cyl. Bo and Stroke	44 x5 4 4 4 x5 4 4 x5 4 4 x5 4	
Name of En	Buda 4-Buda 4-Bu	## # 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
nT resH	38x7 E 42x9 B 36x10 B	THE PROPERTY OF THE PROPERTY AND SOCIAL PROPERTY OF THE PROPER
IT taora	35x5 36x4 36x6 36x5	286 454 454 454 454 454 454 454 454 454 45
Chassis P	2,795 3,095 4,300	5 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
Tons Capa	00000000000000000000000000000000000000	- GOOD AND AND AND AND AND AND AND AND AND AN
	25.00 25.00	H. W. Cor. 100 (100 (100 (100 (100 (100 (100 (100
	Jumbo Jumbo Jumbo	Kalamazoo G Kalamazoo G Kalamazoo G Kalamazoo G Karakakee E. Kearusi Keliy-S. K-35 Keliy-S. K-35 Keliy-S. K-35 Keliy-S. K-45 Keliy-S. K-45 Keliy-S. K-45 Keliy-S. K-45 Keliy-S. K-45 Keliy-S. K-45 Keliy-S. K-45 Keliy-S. K-45 Keliy-S. K-45 Keliy-S. K-45 Kissel Kissel Kis
		NAMES SEE SEE SEE SEE SEE SEE SEE SEE SEE

Abbreviators: Engine—Wank, Walkeha; Cont., Continental; H-S, Herschell-Spillman; Lyc., Lycoming; N.A.; North American; Her., Hervelles, Mil., Milwankee; Wis., Wisconsin; LeR., LeRoi; GBS, Golden, Behrap & Swartz; Des., Beaver. Ignition—Eise, Dise, Berl, Berling, A-L, Auto-Lite. Beeriric Lighting—Nilte, North East; Wag, Wagner Asterisk, electric starting, St. Marker, Mon., Monarch; Sinple, Simple, Sinple, Sinple

920

DIW., Ditweller; Jacx., Jacox; Fost., Foster, Wol., Wohlab. Tires—Asterisk, pneumatic.

I rear Surrana	TO TOR AGE
Steering Gear	Page
əlxA	Oowan Cookan Coo
Final Drive	Worm
Gearset	Wan w
Clutch	SEELL TO THE SEEL
Carburetor	O D D D D D D D D D D D D D D D D D D D
Сочетвог	Part of the control o
Electric ighting	MWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
noitingI	Secondary of the control of the cont
and Stroke	
No. Cyl., Bore	0000101010100000000000000000000000000
Name of Engine	d d d d d d d d d d d d d d d d d d d
Rear Tires	88.83 88.84 88.84 88.84 88.85 88.87 88.87 88.85 88
Chassis Price	2000 2000 2000 2000 2000 2000 2000 200
Tons Canacity	20mm 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Name and Mode	and the control of th
	11111111
Axle	Name
Final Drive	September 17 Name 1 State 1 St
19811890	www wan wan wan wan wan wan wan wan wan
	A A A A A A A A A A A A A A A A A A A
Carburetor	adda kakakakakaka a a a a a a a a a a a
1077101-	SSS SS
Electric Light	ES DEEK BELAGAAAA HALABOOM
	A.I. H. West. West. W. West. W
Sind Sind Sinds	DAY NAST AND DELOS BEST OF THE
No Cyl Bd	
	The state of the s
Rear live	April
36.7 Jaoril 17.7	$\mathcal{L}_{\mathcal{L}}}}}}}}}}$
Tons Capa	2.25.0 28.25.25.25.25.25.25.25.25.25.25.25.25.25.
Mame and I	Master Trac. AC. 153 Master JW. Master JW. Master JW. Master WL. Master W. Master

Abbrevations: Engine—ware, wauscha; Cont, Continental; H-S, Herschelt-Spillman; Lyc., Lycoming; N.A., North American; Herc., Hercules; Mil., Milwaukee; Wis., Wisconsin; LeR., LeRoi; GBS, Golden, Belknap & Swartz; Bea., Beaver. Ignition—Eise., Eisemsan, Strenhei, Ed., Christoff, Chr., Chorth. East, Mag., Wagner; Asterisk, electric starting also. Governo—Walk, Auto-Life, Ding, Mon., Monarch; Simply. Spilldorf; Chr., McCann; Rugles, Hugels, Huge

Concluded Truck Specificationsto Motor Age Monthly Guide

SIXW Final Drive Clutch Carburetor Electric Lighting Lenition No. Cyl., Bore and Stroke Name of Engine Rear Tires Pront Tires Chassis Price Tons Capacity 「あるちりのようのです」であるちょうのではまましているのできました。 Axle Final Drive Gearset Clutch Carburetor Сочегаог Electric Lighting Name of Engine Rear Tires Front Tires Chassis Price Tons Capacity 2000 Titan, T.
Titan, H.
Tower, H.
Tower, H.
Tower, G.
Transport, 20
Transpor COBAH.F 22. 23. 23. jë jë jë jë jë

INDIANA INSURANCE RATES LOWERED

Indianapolis, Ind., April 3—New rates for the insurance of automobiles against loss by fire, theft, tornado, lightning or transportation have gone into effect in Indiana, according to the agreement of 165 insurance companies affiliated with the Indiana inspection bureau. The rates were approved at a hearing before T. S. McMurray, insurance rate expert in the office of Otto L. Klauss, auditor of state.

The new rates are approximately one-third lower for high-priced motor cars. They are lower for new low-priced cars, but higher for such cars after one or more years of use. Three years' insurance may now be written for 2½ times the one-year rate. Lower rates are available for fleet insurance for motor cars or trucks.

KANSAS CITY TRUCK MEN OR-GANIZE

Kansas City, Mo., April 3-Truck dealers in the Kansas City Motor Car Dealers' association have organized a committee, with H. M. Genung, president of the association, as chairman. This committee will study the interests of truck dealers, and make recommendations to the association for action. Besides Mr. Genung, the committee includes Estel Scott, G. M. C.; Harry Crosbie of Crosbie Brothers, Federal; William S. Weaver, Service; A. S. Austin, Republic; and P. L. Matchette, Sterling, all officers of their distributing companies. The truck dealers appointed the committee at a general meeting last week, and other weekly meetings are to be held while plans for work are being formed. Two subjects to be taken up immediately are long trades and long terms on sales.

SEDWICK HEADS HOOSIER CLUB

Indianapolis, Ind., April 3-Charles Sedwick has been elected president of the Hoosier Motor club to succeed H. H. Rice, sales manager of the Nordyke & Marmon Co. B. M. Wylie was asked to assume the presidency of the club but found the business duties too heavy. Other officers are Guy J. Jeffries, first vice-president; George Kanouse, second vice-president; Sol Schloss, third vicepresident, and Dick Miller, treasurer. M. E. Noblet was elected secretary. Other members of the board are: Roy E. Adams, Edward W. Harris, O. D. Haskett, B. M. Wylie, C. W. Wells, L. A. Mansfield and H. H. Rice. Sedwick is a commission man at the Union Stock yards, Indianapolis. He was formerly an official at the Indianapolis Speedway.

PROTEST GASOLINE ADVANCE

Columbus, O., April 3—County Prosecutor Hugo Schlessinger has been asked by the Columbus Automobile Trade Association to aid in preventing the rapid increase in the price of gasoline and if necessary to call a grand jury to investigate the matter. C. S. Magruder, the manager of the Columbus Automobile Trade association made the request.

trnfh

e

vP

s.

es e

ar

a

nt is of

a-

n-

g_

iln,

g, nhe

st

re

en

ng

es of

H. &

to

ut y.

rst

nd ceer.

ry.

OY

A.

a

ck

rly

se-

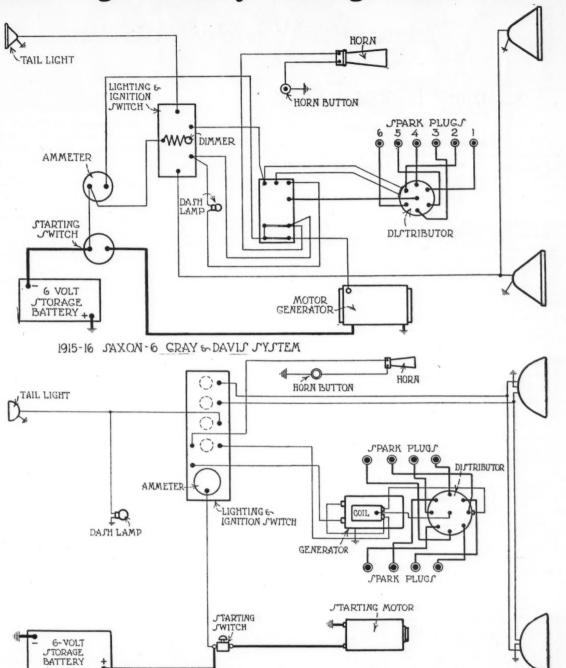
ked so-

in-

if stithe

oile

Motor Age Weekly Wiring Chart No. 72



1916 OLDSMOBILE 44 DELCO SYSTEM

THIS WEEK

1919-Oldsmobile

1915-16-Saxon

Allen—Dec. 18, '19
Auburn—Nov. 27, '19; April 1, '20
Briscoe—Oct. 16, '19
Bulek—Oct. 23, '19
Case—Oct. 2, '19
Crow-Elkhart—June 26, '19
Chalmers—Nov. 27, '19
Cutting—Nov. 6, '19
Daniels—Dec. 4, '19
Davis—Dec. 4, '19
Dixie—April 1, '20
Dorris—Dec. 11, '19
Dort—March 25, '20
Empire—Oct. 30, '19
Essex—Oct. 23, '19
May 15-22, '19

Franklin—June 19, '19; Dec. 11, '19
General Battery Charging—Sept. 25, '19
General Magneto Diagram—June 5, '19
Haynes—Oct. 9, '19
Hupmobile—Oct. 16, '19
Internal Connections—July 10-17-24, '18
Kecton—Nov. 6, '19
King—July 3, '19
Kinsel—July 3, '19
Lexington—Jan. 1, '20
Liberty—Jan. 1, '20
Marmon—Dec. 25, '19; Jan. 22, '20
Maxwell—Aug. 14, '10
Mercer—Aug. 28, '19; Nov. 27, '19; March
25, '20
Mitchell—Jan. 8, '20
Monroe—Oct. 30, '19
Moon—Jan. 29, '20; March 11, '20
Moore—March 4, '20
Nash—March 11, '20
National—June 10, '19; Feb. 12, '20
Oakland—Oct. 16, '19
Olympian—Jan. 22, '20

Owen Magnetic—Sept. 18, '19
Packard—June 19, '19; July 31, '19; March
18, '19
Paige—July 3, '19
Paige—July 3, '19
Paterson—June 26, '19; July 9, '19
Pierce-Arrow—Oct. 2, '19; Feb. 5, '20
Pilot—March 4, '20
Premier—Dec. 18, '19; Feb. 26, '20
Reo—Aug. 21, '19; Oct. 9, '19; Nov. 13, '19
Roamer—March 18, '20
Scripps-Booth—Jun. 15, '20
Stanley—June 26, '19
Stearns-Knight—Jan. 8, '20
Stephens—Feb. 12, '20
Studebaker—Dec. 25, '19
Stutz—Feb. 5, '20
Templar—Jan. 29, '20
Velle—Sept. 25, '19; Feb. 19, '20
Westcott—Jan. 15, '20
White—Sept. 25, '19; Feb. 19, '20
Willys-Knight—Feb. 26, '20
Special Systems for Fords—May 15-22, '19

Trom the Tour Winds Climpses at the World of Motordom

Coming Motor Events

AUTOMOBILE SHOWS

Gloversville, N. Y	5	to	10
Albany, N. YAutomobile Show	6	to	10
Brooklyn, N. YAutomotive Products Show	10	to	17
Fort Worth, TexAutomobile Show	12	to	17
Kingston, Ont	to I	Иаз	1
Macon, Ga	Y 6	i te	8

RACES

Indianapolis Speedway500-Mile Rac	e May 31
Uniontown, Pa Speedway Ra	nceJune 12
Tacoma, WashSpeedway R	nceJuly 5
Cincinnati, O Speedway R.	nceSept. 6
Uniontown, Pa Speedway R	neeSept. 6

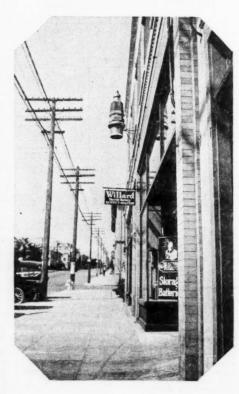
TOURS

Omaha	Neb Truck I	Reliability	RunJune	1
Lake I	luron Tour		July	4
New Y	ork-San Francisco Glidden	Tour	Septemb	er

Oppose Lincoln Highway Route Change-A suggestion that the route of the Lincoln Highway be changed so that it will traverse Chicago instead of Joliet and Will county, is being bitterly fought by the various counties in Indiana and Northern Illinois affected. Chicago Heights, Joliet and Aurora are the three principal cities affected and will strongly oppose any change in the present routing. A committee headed by Congressman Ira C. Copley, has charge of the opposition. It will be maintained that Chicago's place with relation to the Lincoln Highway should be that of a side-track off the main thoroughfare. Such motorists as may desire can make the side trip to the metropolis, but it is asserted that the bulk of the traffic should avoid the congested city. It has been computed that 100,000 motor car tourists used the Lincoln Highway during 1919. Of these 10,000 made the complete tour to the Pacific coast. It has been computed that these tourists used 4,600,000 gallons of gasoline; 230,000 gallons of lubricating oil; and purchased 9200 sets of tires, involving a total expenditure of \$2,500,000. The value of this highway to the dealers in supplies along the route can thus be partly realized.

Figures on Cars in France—There are 94,884 passenger-carrying automobiles in France, according to official figures just issued. In 1914 the number was 107,535. These figures must not be accepted as an indication of the total number of automobiles in France. The official returns only cover privately-owned passenger cars which have paid taxes, no account being taken of trucks, taxicabs, motorcycles, motor omnibuses or cars engaged in private hiring business. It is certain that there has been an enormous

A Mammoth Spark Plug



An enterprising repair shop man in San Diego, Cal., has placed on the front of his establishment a novel sign in the nature of a mammoth spark plug, made of corrugated iron, tin and colored glass, standing some 4 ft. in height. For a time he had it connected with a battery and the noise of its "sparking" attracted attention to the place of business

increase in the number of trucks in service since the war, but no official figures are available regarding these.

The district of France which has the greatest number of cars is Paris with 16,089; the Rhone district, including Lyons, has 3,037 cars.

California Building Roads—According to a report just published by the engineer of the State Highway Commission, \$26,635,690.19 has been spent by the commission out of the moneys raised from the first two bond issues and 2389 miles of highway have been completed or are under contract. Of this mileage 1316 miles is in the northern part of the state and the remainder in what is known as Southern California. The largest expenditure in any one county has been in Los Angeles county where the commission has spent \$2,157,767.50 in building new roads.

Highway Brings Montreal Business— The exact value of the King Edward Highway to the city of Montreal is difficult to estimate, but one of the benefits which will accrue during the touring season will be the expenditure of about \$12,000 per day in Montreal by motor tourists. This is based on a minimum of sixty American tourists per day, and is averaged at a slight increase over last year's figures.

Pennsylvania Registration Figures—Receipts from 1920 automobile licenses for January and February were \$4,391,266, or \$1,330,180 higher than during the similar period last year, when all records were broken, according to the latest report from the registrar to the Highway department. To March 1 there had been 286,068 licenses issued to pneumatic tired machines and 37,405 to solid tired vehicles.

The pneumatic tired machine licenses so far in 1920, number almost 30,000 more than last year's first two months and there was a gain of more than 9000 in solid tired machines. Thus far there have been 68,981 drivers and 9415 dealers' licenses issued.

Lincoln Motor Employes Share Profits—Lincoln Motor Co., Detroit, employes are to share in the company's profits in the opportunity offered them to become stockholders under a profit sharing plan. They will be allowed to purchase class A stock at 20 per cent below par. A block of stock was set aside for this purpose when the company was reorganized last January. The only condition imposed is that employes shall have been in the service of the company at least one year.